Railway Age

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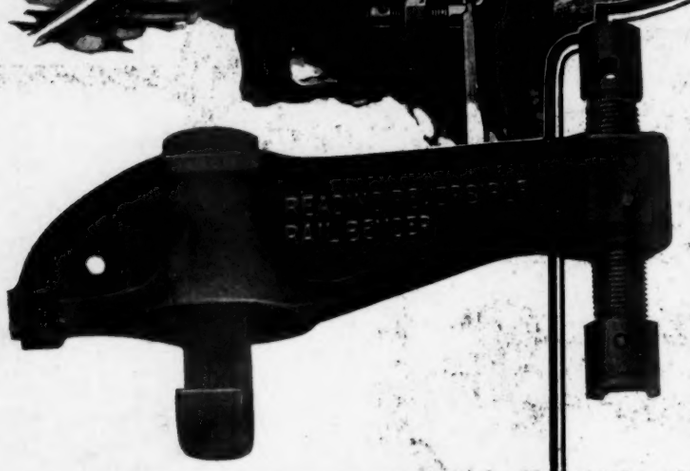
Alphabetical Index to Advertisements, Page 90 Classified Directory of Advertisers, Page 86



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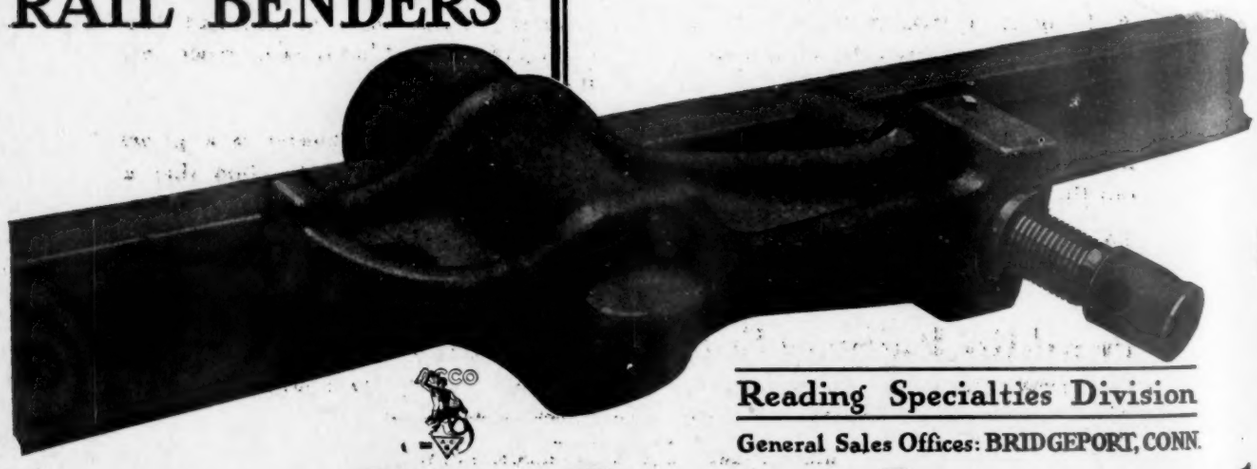

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EDITORIAL

Railway Age

The Table of Contents Will Be Found on Page 5 of the Advertising Section

The railways are now handling a traffic greatly exceeding that of this season of any previous year and only slightly less than the maximum ever handled at any time. In spite of this fact, they have cleared up practically all of the congestion which developed last fall and almost all of the embargoes have been lifted. At the same time, the car shortage has been reduced gradually but steadily until on April 15 it was less than 50,000 for the first time in more than six months. Therefore, in spite of all handicaps, a very heavy traffic is being moved smoothly. This is a record of which the roads may justly be proud. However, every indication points to a continuation of this traffic at a high level throughout the summer and fall—a level so high that there remains but a small margin short of actual congestion. Under this condition, continued vigilance is necessary on the part of *every* operating officer to see that the present even flow of traffic is maintained. Just as a small stone rolling in a mountain torrent may lead to the blockade of a large waterway if it becomes lodged, so a local delay at a small terminal, unimportant in itself, may interrupt the even flow of traffic and start a congestion which may extend far before it can be arrested and require weeks to overcome. If the roads are to continue to function at their present high level, every division and every terminal must handle promptly the traffic turned over to it. Every operating officer, system or division, must be continually alert to see that the part of the transportation machine under his supervision functions regularly. If this is done, the entire machine will continue to operate at the present high level of efficiency, but if he is caught off his guard trouble will follow.

Every Transportation Officer a Unit

Reports of freight claim reductions are apt to lose much of their significance when presented in dollars and cents. Translated into terms of facilities they make a deeper impression upon all who see them. The Pere Marquette has called the attention of its employees to the fact that it reduced its freight claims last year by $362,161, an amount sufficient to buy nine new switching locomotives. The figures themselves, representing a reduction of nearly one-half the claims in 1921, are ones of which any road might well be proud. But they are not nearly so arresting as a statement that a saving equal to the cost of nine new switching locomotives had been accomplished. There is no more sensible effort being made today than the widespread campaign to reduce loss and damage claims to a minimum. Millions of dollars are lost every year by railroads which fail to devote constant attention to this problem. Claims are almost invariably the result of carelessness and inefficiency on the part of employees engaged in the handling of the freight. Those roads which have turned their attention most largely to this item in their expenses have demonstrated that there are means almost without number to overcome this tendency towards inefficiency on the part of their men. Practical instructions and demonstrations of proper methods of freight handling, contests of various sorts, as well as a less tolerant attitude toward damage to freight, have proved equally efficient in reducing carelessness and developing a co-operative spirit to make every effort to lessen the burden of loss and damage claims. The rewards of even the smallest efforts in this direction have been astounding. During 1922, when the campaign for carefulness was gathering momentum over the entire country, many roads cut the cost of their loss and damage claims in half and saved millions of dollars for more profitable uses. Money saved through reduced claims is income with only a negligible expense. Carefulness costs little and repays much. Since it pays high dividends in cars and locomotives and in other betterments, it is an excellent investment for any railroad. Saving money through reduced freight claims is almost like getting something for nothing. And nine new locomotives from time to time are a welcome gift to the average railroad.

The Reward of Carefulness

The difficulty of regulating automobile traffic at highway crossings has long been recognized. As long as 15 years ago it was suggested that the only type of warning signal which could be depended upon to stop all traffic was one that combined the attributes of the warning device with those of a barrier so strong that the automobile rather than the structure would be destroyed by the impact. While this comment may be criticized as treating facetiously something which is a decidedly serious matter, it serves to emphasize a basic defect in the protection now provided by the railroads at highway crossings. It is the all too common experience that certain drivers will disregard warning signals, break through gates and run down flagmen. In fact, at some crossings, the work of the flagmen is so hazardous that it is only with extreme difficulty that the railroads are able to recruit men for these positions. This state of affairs stands out in sharp contrast to the conditions obtaining in the ordinary regulation of highway traffic at street intersections, indicating that the average driver will exercise far greater precaution to save himself from a fine or a "bawling out" by the traffic policeman, than he will to avoid getting killed at a railroad crossing. In other words, because the railroad employee at the crossing has no authority to enforce his regulation of the traffic the drivers seem to feel that compliance with a stop signal is a matter that rests entirely with their own judgment and that they are at liberty to take a chance if they feel like it. This basic defect in the protection of highway crossings at railroads was recognized recently by the city of Youngstown, Ohio, where action taken by the municipal officers at the instance of the management of the Erie Railroad has resulted in placing the traffic in three streets at crossings with the railroad under the control of regular uniformed policemen. Experience shows that the plan is a decided improvement over the protection provided by the railway employees. The police have no trouble in stopping the traffic in ample time to permit the gates to be lowered. In fact, it would seem to indicate that the gates are no longer necessary. These policemen are to all intents and purposes a part of the regular police force in the city and report to the traffic police captain, although the railroad provides for their compensation. It would seem, however, in view of the fact that the problem imposed at these grade crossings is one for which the public

Better Protection at Highway Crossings

bears a large share of the responsibility that the expense of such protection is something for which the public should at least pay a just portion. But, entirely aside from this particular phase of the problem, it is clear that the practice of giving crossing watchmen the authority of the uniformed police is a measure worthy of much wider application.

Promotes Intensive Operation

It has long been axiomatic that every movement of a car shall be in the direction of its destination. This is carried to the extent that in the design of classification yards every step advances the car towards its destination. These measures are taken for the purpose of avoiding all duplication of effort. It is equally important that all unnecessary switching of cars be eliminated in order to conserve the terminal facilities and the equipment for such classification work as must be done and which, after doing away with all unnecessary switching, will tax the facilities available to the maximum. Roads have long since found that perishable traffic can be moved most rapidly by handling solid trains intact through as many terminals as possible. They have been slow, however, to recognize the advantages of the application of this same practice to other classes of traffic for which quick delivery is not so essential and have allowed these cars to occupy valuable track space and congest terminals. Yet the same principle holds true here just as directly as with fruit, meat and live stock. At the present time when the traffic is taxing the capacity of the facilities, particularly at terminals, every car that is switched unnecessarily reduces the capacity of the road as a whole to that extent. This provides an added reason for reducing switching to the minimum, entirely aside from motives of economy. The extent to which it is possible to make up trains for remote destinations and move them intact through intermediate terminals is indicated by the fact that month after month the Baltimore & Ohio is sending 30 per cent of all of its trains through terminals without breakup. The effect of a record such as this on the capacity of terminals, on the demands for motive power and cars, on car repairs, etc., is evident to every operating officer. The possibilities of the plan as a means of reducing duplication of effort and of lost motion and as a means of increasing the capacity at the limiting points deserve most careful consideration now in preparation for the peak load expected this fall.

The Caboose and Morale

The average trainman in freight service spends the larger part of his working hours in and around his caboose. Naturally the comfort and conveniences which are provided for him there give him his idea of the company's interest in his welfare. Bulletins referring to employees and management as "one big family," or some other such friendly term, or statements by the officers of the company's interest in its employees have a hollow and insincere sound to trainmen to whom dirty and poorly equipped cabooses are assigned. Protestations of interest in the welfare of employees are not necessary when tangible evidence of it is given; if there is no such evidence, the mere claim that it exists avails nothing. Many roads do not have a sufficient supply of well built, easy riding cabooses. Some roads, however, which are adequately equipped with such cars lose all the good effect of their expenditures by not keeping them in proper condition. Especially is this true where many crews who work every day are not provided with regularly assigned cars; instead they take the caboose "first out" on the caboose track. Cars handled in this way are almost invariably dirty and poorly equipped with cushions, lamps and other fixtures. No company can reasonably expect much in the way of loyalty from men who are forced to use such cars regularly. On other roads where all cabooses are regularly assigned the managements often have strict rules regarding the amount of "fixing up" which the crews can do on them. There must, of course, be some regulation of the alterations and additions permitted, but these rules should be as lenient as possible and when the cabooses are shopped the repair forces should not be allowed to restandardize the cars, tearing out everything not shown in their blue prints. The road can do its part by providing safe and comfortable cars and by permitting its employees to make them home-like. The result will lend compelling force to appeals by the management for the co-operation of its train service employees.

Real Improvements Which Cost Nothing

Most of the improvements which are planned to enable the handling of prospective increased traffic and to secure greater efficiency of operation are expensive. Moreover they require time for completion. Extensive additions to terminals, double tracking, grade revision and other similar projects now under way or planned for the immediate future may not be of much service by the time the peak of traffic is reached this year. There are, however, two improvements which can be successfully carried out on parts at least of nearly every railroad in the country—which improvements cost next to nothing and require but a short time to bring into use. These improvements are the operation of "main trackers" and the "peg" system. The former, as the name implies, means the making up of freight trains in such a manner that they need not be switched at every division yard. The latter means the operation of all freight trains on non-time-table schedules stretched out over the entire 24 hours, thus preventing the "bunching" of trains and providing for a maximum number of movements regularly spaced so as not to congest yards. A number of roads operate "main trackers" regularly and the practice is spreading. Reporting to the Committee on Economics of Operation of the American Railway Engineering Association, the Chicago, Burlington & Quincy estimated its savings during one year's operation of main trackers at $1,500,000. The peg system has been in successful operation on the Buffalo, Rochester & Pittsburgh for six years, with a saving of from one to two hours in the average time required to operate a train over divisions approximately 100 miles in length. Improvements which cost millions and require months of time are necessary and there should be more of them. With heavy traffic already moving, however, and with still heavier business in prospect, time is particularly valuable. Funds, of course, are always precious. Improvements, therefore, which are effective but which require very little of either time or money merit at least careful consideration.

Quality Machines Needed

In view of the output and long life expected of railroad shop machinery, it is obviously false economy to purchase any but the best modern machines. This does not in all cases mean machines equipped with all the latest ultra refinements, but it does mean that the best of materials, workmanship and design are none too good for machines used in railroad shops. These qualities cannot be secured in machines or any other product without paying for them, and while most railroad men appreciate this fact it is evident that some do not. In a recent specific case, a railroad purchasing agent requested bids on three makes of a standard machine tool, any one of which the mechanical department had given him authority to buy. Bids were submitted and subsequently one of the manufacturers who had quoted a higher price was called in

and told that if he wanted to cut his price he had an opportunity to do so. Feeling that his quotation represented only a reasonable margin of profit over cost, he refused. The railroad purchased the cheapest machine of the three although either of the other two machines would probably have increased the shop efficiency on the operation to be performed at least 25 per cent, and this is one unfortunate example of the working of the three-machine option, described at greater length on page 733 of the October 21, 1922 *Railway Age*. The purchasing department takes credit for saving two or three thousand dollars while as a matter of fact the railroad will lose three or four times that sum in the next few years. Railroads have the right to play one manufacturer against the other and thus benefit by prices fixed by the law of supply and demand. No one denies this right which, in the case of the railroads at least, is also a duty. The fact remains that in these days of high material and labor prices quality machines are costly, and making price the deciding factor automatically prevents the railroads from securing and benefiting by the best modern machines. The railroad mechanical department is responsible for repair costs and, if it thinks the latest type of high production machine is needed in a certain shop, should not be debarred from ordering and installing that machine simply because it costs more than other machines of a similar type on the market.

Remarkable Increase in Freight Business

Few people realize how great has been the increase in the freight business handled by the railways recently as compared with the corresponding weeks of previous years. It has been announced repeatedly that the number of cars loaded with freight has broken all records for this time of year but how completely all previous records have recently been surpassed is not generally known. One almost begins to wonder in studying the figures if the productive capacity of the country has any limit. In January, February, March and April the total number of cars loaded with freight was 15,094,386, an increase over the previous high record—that of 1920—of almost 11 per cent. That sounds big enough; but it does not make an adequate impression because the freight business has been increasing at an accelerating rate. In the four weeks ended April 28 the total number of cars loaded was 3,763,963, or 29 per cent more than in the corresponding weeks of 1920. If cars were carrying smaller loads than at the same season in past years these figures would not be so significant, but the average tonnage being loaded per car is relatively large. The average number of tons hauled per loaded car in January was 29 tons. This was larger than in any previous January except in 1921 and 1918. The average load per loaded car in February was 28.6 tons. This was larger than in any previous February. The American Railway Association in its recent "Traffic Forecast for 1923" estimated that the number of cars loaded weekly would reach its peak in the week ended October 20, and would then be 1,080,000 cars. The highest record ever reached was in the week ended October 14, 1920, when it was 1,018,539 cars. If general business activity should continue to increase as it did until toward the end of April there would be a demand in October for the loading and movement of approximately 1,250,000 cars a week. Even those who are most optimistic regarding the amount of business the railways can handle with their existing facilities can hardly believe they can handle that much business. Recent movements of the stock market have indicated that the increase in general business activity may not continue to go on as rapidly as it has for a few months. Even if it does not, the signs indicate that the railways will have demands made upon them next fall which will far exceed their capacity.

Support the Safety Work

It is the natural inclination of a railway officer to rate fairly high the importance of the department with which he is connected. Thus the energetic and progressive mechanical officer is ever prepared to uphold the importance of the mechanical department against all comers, the transportation officer ready to stand by his branch of service, the engineering officer in like manner and in no less a degree. Each officer or workman within the department, in turn, believes in the importance of the particular position he occupies and the work to which he gives his time and thought. This is one of the results of specialization, and it is salutary that it prevails, as the efficiency of an officer's work or a department's accomplishments must depend largely upon the degree to which such an attitude is present. But it is quite important at the same time that no officer allow his viewpoint to become narrowed to such an extent that he is not in a position to take that degree of interest and render that support to another department or another's work that he himself needs and has a right to expect from the others to attain the best results. The work of the safety officers on railroads is a case in point. It has only been in the last few years that railroads have made a specialty of safety work. At the present time, however, safety officers are employed on most of the railroads, some of whom devote their entire time to the subject. They are engaged in an important work. In reducing accidents they are saving money for the railroads which may thereupon be spent for more constructive work than for paying claims for injuries sustained or repairing equipment damaged in wrecks. They are protecting from injury or death the employees and the public. The work in which they are engaged and the contacts afforded by the meetings held in the interest of safety, are, moreover, good-will builders. As R. H. Aishton said at the recent meeting of the safety officers, the accomplishments of the railroads in reducing accidents, both within the railroad and as affecting the public, afford one of the most effective refutations of the claim that the railroads are not well managed. The attitude taken by some officers that specialized safety work is undeserving of their interest is, therefore, a wrong one. Their attitude should be determined by a better understanding of what specialized safety work has actually accomplished on railroads where it has received general support and what it can do within their jurisdiction upon receiving their support.

Some Results of the Shop Strike

EVER SINCE LARGE RAILWAYS made settlements of the shop employees' strike with the shopcrafts' unions last September there has been much discussion of the question whether the railways that settled or the much larger number that did not settle have been gaining more by the policy adopted by them. The spokesmen of the shopcrafts' unions have frequently given out statements attempting to show that the railways that have refused to settle have been letting their equipment deteriorate; have been incurring an enormous amount of unnecessary expense, and have been "breaking down." The railways of the country as a whole in the week ended April 21 loaded 35 per cent more carloads of freight than in the corresponding week of any previous year. They could hardly have done this if that large majority of railways which have not settled with the unions had "broken down," or had been on the verge of breaking down.

In an editorial in its issue for September 23, 1922, just after several railways had made settlements under the so-called "Baltimore agreement," the *Railway Age* said: "It will be well worth while to study the comparative results obtained on the railways which settled and on those that re-

fused to settle." The Interstate Commerce Commission recently began an investigation of the adequacy and condition of railway equipment. It opened it on the Lehigh Valley, which on February 1 had a larger percentage of its locomotives in bad order than any other large railroad in the country. This evidently was what prompted the commission to begin its investigation on that road. The spokesmen of the labor unions immediately began issuing propaganda to show how much worse were conditions on the Lehigh Valley than on some other railways that have settled. The Lehigh Valley for years has been an efficiently and successfully managed property. Its long record of good management must be considered in connection with charges that the relatively bad condition of its equipment indicates poor management. The principal explanation of the situation on the Lehigh Valley appears to be that it operates in a territory where labor unions of all kinds are especially strong. In consequence, it has found it unusually hard to get men to take the place of its striking employees, and in addition it has been made the object of most determined and vicious attacks. Recently, however, it has been making marked progress in getting its equipment into better condition, and in handling its traffic more satisfactorily. The only kind of evidence that throws light on the question whether the roads that settled or those that have not settled have gained more by the policy adopted by them is a comparison between the results obtained on practically all the railways that settled, and practically all the railways that have not settled.

The *Railway Age* took the position when the question of making settlements was under consideration early last fall that the policy which should be adopted depended largely upon the circumstances of each individual railway and was a matter to be determined according to the best judgment of each railway's management. There were some railways that had the strike actually won at that time. There was no good reason why they should settle. There were other railways on which the strike had been highly effective and whose problem was, therefore, entirely different.

There are now available data showing what was accomplished by the various railways in restoring conditions to normal during the first six months after settlements were made by several lines. This period is too short to determine whether the railways that settled or those that have not settled have adopted the policy which will prove wiser in the long run, but it is worth while now to review the results obtained in these six months.

We have made a study of the statistics of 12 railways on which settlements were made last September, and of those of 29 railways on which settlements were not made. The situation which existed on these railways on October 1, indicates why some railways settled and others did not. At that time the railways that settled had over 15 per cent of their freight cars and almost 32 per cent of their locomotives in bad order. The railways that did not settle had less than 11 per cent of their freight cars and only 22 per cent of their locomotives in bad order. These figures show that, as a whole, the railways that settled were in worse shape than those that did not. On April 1, 1923, six months later, the railways that settled had 16.7 per cent of their freight cars, and 20.8 per cent of their locomotives in bad order, and the railways that did not settle had 8 per cent of their freight cars and 19 per cent of their locomotives in bad order. The significant figures, of course, are those for locomotives. They show clearly that the roads that settled have made greater progress than the others in improving the condition of their equipment. But their greater progress was all made in the four months from October 1 to February 1. On the last named date the roads that settled had 20.7 per cent of their locomotives in bad order, and those that did not settle, 21.1 per cent. On March 1 each of the two groups of roads had exactly 20.8 per cent of their locomotives in bad order. On April 1 the roads that settled had 19.4 per cent of their locomotives in bad order, and those that have not settled only 19.1 per cent. These figures show that in February and March the roads that have not settled made better progress than those that have.

Some interesting comparisons may be made between the conditions which existed on the two groups of railways on July 1, when the strike began, and on April 1, nine months later. When the strike began the railways that finally made settlements had 3,468 locomotives in bad order, and on April 1 they had 3,301 locomotives in bad order, a reduction in bad order locomotives of 5 per cent. On July 1 the railways that have not settled had 5,232 locomotives in bad order, and on April 1, they had 7,298 locomotives in bad order, an increase of almost 40 per cent. In June the maintenance of equipment expenses of the railways that later settled were $26,325,000. In February—the last month for which complete statistics are available—the maintenance of equipment expenses of these roads were $27,844,000, an increase of about 6 per cent. In June the maintenance of equipment expenses of the railways that have not settled were $50,160,000, and in February they were $60,313,000, an increase of 20 per cent. In the first five months after the settlements were made the maintenance of equipment expenses of the railways that settled averaged $4,557,000 monthly more than in June, an increase of 17 per cent. In the same months the maintenance of equipment expenses of the roads that did not settle averaged $15,588,000 more than in June, an increase of 31 per cent.

All these statistics show that in the months immediately following the settlements the railways that settled made more rapid progress in restoring normal conditions than those that did not settle. The former immediately got back their experienced employees and were relieved of the necessity of making expenditures to cope with the strike. Most of the latter had to continue to operate their shops with men a larger part of whom were new and inexperienced, and to make extraordinary expenditures to fight the strike. But, as also has been shown, the railways that did not settle made relatively greater progress in reducing the amount of bad order equipment in February and March than those that did settle. Furthermore, when comparisons are made between railways that did settle and those that did not settle which are in relatively good condition they are more favorable to the latter than to the former. On April 1 only one railway that settled had less than 15 per cent of its locomotives in bad order, while there were six railways that did not settle that had only from 12 to 15 per cent of their locomotives in bad order. Spokesmen of the labor unions have called attention to the fact that some railways that settled have been earning much larger net returns this year than last, while some that did not settle have been showing bad financial results.

Comparisons can be fairly made, however, only between the roads in the two groups that have done the best, or between those that have done the worst. The New York Central and the Baltimore & Ohio, the two largest systems that settled, earned 27 per cent more net after rents in January and February, 1923, than in the same months of 1922. This is an excellent showing. But the Santa Fe and the Illinois Central, two of the largest systems that did not settle, earned 80 per cent more net after rents in January and February, 1923, than in the same months in 1922.

The facts about the results gained by the railways that settled the strike and those that have not settled may be summarized into two sentences: First, those that settled have as a whole thus far gained by settling. Secondly, the time which has elapsed since the settlements were made is too short to determine whether those that settled or those that did not settle adopted the policy which, in the long run, will be best for them. When the facts regarding the results obtained for an entire year following the settlements are available they will throw very much more light upon the question than

those now available. Perhaps we shall have to wait for another shop employees' strike to apply the acid test to the question whether it was wiser to settle or not to settle. Meantime, everybody will agree in hoping that it will be a long time before there will be another such strike. The more the facts regarding the results of this one are studied the more strongly disposed will be both sensible railway officers and sensible labor leaders and employees to try to adopt every reasonable method for avoiding strikes in future.

Varying Signal Expenditures With Traffic Needs

AT THE ANNUAL MEETING of the Signal section in Chicago last March the Committee on Economics of Railway Signaling presented a plan for the operation of a single track line by signal indication. The line involved in the study consisted of three miles of double track and 42 miles of single track. This study was based on an important single track line with heavy traffic which is taxing its capacity to the limit. The estimated cost of the automatic block signals proposed was $210,300 and of the interlockings, including distant operation of switch machines, $513,955; a total estimated cost of $724,255, or approximately $16,000 per mile of track. Unfortunately, this report may be construed to mean that the committee considered interlocking, including distant operation of switch machines, as essential in *all* installations, whereas in many cases the amount suggested for interlockings can be spent to much better advantage for additional automatic block signals.

The amount of traffic a road handles and the physical characteristics of the line are the factors determining the kind of an installation that is desirable. Lines with light traffic can be operated satisfactorily with the simple manual block system. As traffic increases conditions justify additional signaling, and controlled manual block may be installed. As traffic continues to increase, there comes a time when operation under this system becomes uneconomical due to train delays and increased wages for a greater number of block operators, and an expenditure is justified for automatic block signals to shorten up the blocks and provide increased track capacity. As traffic becomes still more congested further refinements are warranted, such as the installation of interlockings, including distant operation of switch machines at certain stations and passing sidings. After this stage is reached, if greater capacity is needed, the construction of double track is the only recourse.

The Economics Committee should, and no doubt will, prepare data showing the conditions of traffic under which particular installations will prove economical. An expenditure of $16,000 a mile closely approximates the cost of an additional track in many locations and would not be warranted except in exceptional cases of which that on which the study is based is one. The annual net return on the investment in this particular case was estimated to be 26.38 per cent. For the particular stretch of track on which the study is based, because of the conditions, it would seem that such an expenditure would be justified. In many instances the additional money required for interlockings and remote switch control could be expended to better advantage for an additional mileage of signals, designing the signal installation, however, for the addition of interlockings at a later date when traffic has increased sufficiently to warrant a further expenditure. It is hoped that the Economics Committee will take steps in its next report to correct any misconceptions which may have arisen from a study of the report presented; for managements may hesitate to authorize budgets for signal expenditures, involving amounts as large as that mentioned when, in fact, many traffic conditions can be relieved by installations costing from only $4,000 to $5,000 a mile.

It Is Getting Worse Every Minute

TRAFFIC DENSITY on public highways is now far beyond anything dreamed of 20 years ago, and with an annual production of automobiles running into millions, it is certain that present conditions are only a circumstance to what we must contend with in the future. Even now every pleasant Sunday gives rise to conditions of congestion on highways many miles from large population centers, that were formerly encountered only on the business streets of great cities. As a consequence, the problem of the grade crossing of two highways is one of only little less magnitude than that encountered where an important highway crosses a railroad. Therefore, in any case where a railroad and an important highway lying side by side are crossed by another highway, the problem of handling traffic over this double crossing, with any reasonable degree of safety, is as formidable as any highway traffic problem likely to present itself.

As a case in point, on a double crossing of this kind, involving a three-track-railroad, traffic on the intersecting highway was stopped by a long freight train, resulting in the gathering of a line of automobiles, closely spaced. Upon the clearing of the crossing with the raising of the gates these cars endeavored to cross the tracks in close formation, only to have the leading car stopped by the traffic on the highway paralleling the railroad, so that several of them were stalled directly on the tracks for more than a minute with absolutely no chance to clear for trains that might have approached on the other two tracks.

The advocate of grade separation would immediately diagnose this condition as one so dangerous as to call for the immediate elimination of the crossing by raising or lowering the tracks, but while this would eliminate the hazard insofar as the railroad is concerned, it has happened in numerous instances, in the event of track elevation, that the danger at the highway crossing was actually increased because of the obstructions to the view imposed by the presence of the railroad abutments and retaining walls. Because of this very condition the authorities of one city were recently compelled to close a street subway under a railroad paralleling a heavy traffic highway.

At first sight, this problem might seem to be merely a local one, but it is assuming national importance because of the general tendency to select highways lying generally parallel to the railroads for through traffic routes. Even in cases where they are located at some distance from the railway the business interests in towns along the line have been successful in many cases, in diverting the highway so that it must traverse "Main Street," which in nine cases out of ten, lies parallel to the railroad or crosses it at the point of maximum congestion, namely, in the immediate vicinity of the passenger station.

In large measure the action taken on such matters is beyond the control of the railway managements. Nevertheless, it behooves railway officers to exert their influence, whenever the occasion affords, to discourage highway locations that will result in these dangerous crossings of railway tracks. The least that can be done is to point to the gravity of the hazard and suggest other locations which will decrease the danger. But, in many cases the danger is not a potentiality, but an actual fact, as in the example cited above, and here again, we are confronted with the fact that the railroad, acting alone, cannot solve the problem. Assistance must be had from the public authorities. Such conditions call for the control of the traffic at the intersection of the two highways as well as at the railway crossing, a duty which must necessarily be borne in part by the public. Moreover, since the problems with which we are now confronted arise primarily from the enormous increase in the traffic on the highways, public authorities must be impressed with the fact that the burden of adequate protection for the highway users is one of which they must bear a just proportion.

Letters to the Editor

[*The* RAILWAY AGE *welcomes letters from its readers and especially those containing constructive suggestions for improvements in the railway field. Short letters—about* 250 *words—are particularly appreciated. The editors do not hold themselves responsible for facts or opinions expressed.*]

Making Friends for the Railroads

PITTSBURGH, Pa.

TO THE EDITOR:

I have read many articles in the *Railway Age* regarding the making friends for railroads.

I do not know whether or not our railroad friends will take kindly to suggestions from outside. However, there is one little matter I would like to call to your attention which is insignificant, yet it shows why railroad employees frequently fail in this important duty.

During the time of government control of railroads various roads were instructed that in sending a telegram to other roads or to private concerns the name of the railroad be added to the signature. This plan was all right in some instances, but when a private concern spends money to telegraph to an agent or officer of a railroad asking for information and when the answer is received (charges collect) from the railroad representative and from 25 to 50 cent charges added to cover the several extra words which are of no value to the inquirer, it seems to the outsider that the railroad man is not using ordinary good judgment.

Another item of irritation is the fact that a good many roads at the present time send answers "collect" to inquiries regarding the failure of the roads to give reasonable service. These answers are often prepared in language two or three times the length that is really necessary, all of which is added expense to the outsider.

I realize that railroad managing officials do not come in contact with these small things, yet I am sure that they mean considerable when added to others of similar nature.

C. B. ELLIS,
General Traffic Manager, the Gulf Companies.

Destroying a Good Impression

TUCSON, Ariz.

TO THE EDITOR:

I have read in these late years many advertisements of the railways in which the appointments of their limiteds are given full description. Quite usually the equipment is as represented; the trains that are run are excellent. But when one takes passage on such a limited, one is rather too often disappointed in the way that the railways allow their engineers to handle such trains. I mean quite particularly the way they start and stop them. It is true enough that there are instances when it is quite impossible for an engineer to make a smooth start because of the weight and resistance offered by a modern heavy Pullman train to the amount of tractive effort his locomotive can put forth. But it is submitted that there is scarcely any excuse, except in emergencies, for bringing a train to a stop under circumstances making it necessary to hold to some part of the furniture in order to keep one's seat. No engineer will deny that it is possible to bring a passenger train to a smooth stop by releasing the brakes just before the stop is made. The proof of the possibility is in the fact that it is being done on certain roads.

It is also safe to say, I believe, that 75 per cent of the rough starts could also be eliminated. This may seem a trifling matter, but it has a tremendous influence upon the travelling public's impression of the railroads. It is the most common point of contact of the public with the railroad —the passenger train—and if after offering a man the appointments of a fine train, the railroad takes no particular pains in handling it and him, then nothing but a negative impression is left.

A European friend of mine once told me: "Your American trains are fine as far as the equipment goes; but the crude way in which the trains are started and stopped is unpardonable." I trust that this will give superintendents and trainmasters a suggestion.

ARNOLD SITZ

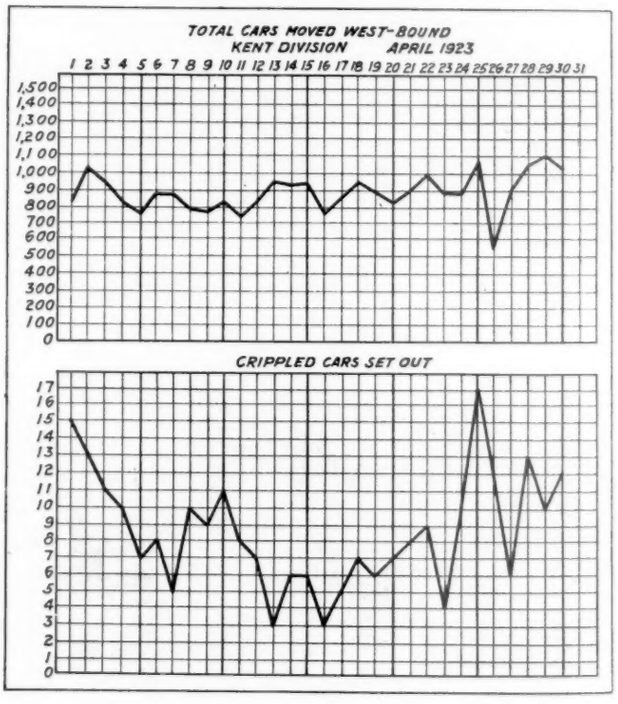
Use of Graphic Chart

KENT, Ohio.

TO THE EDITOR:

I send you herewith a graphic chart showing the number of cripple cars set out on our Kent division westbound during month of April, 1923. A graph is also shown which illustrates the total number of cars moved westbound over Kent division for the same period.

We are using this method in order to keep the data before us from day to day. The mechanical department is called



upon to explain the result for any increase in the number of cars that are set out of trains on the division. This, for the reason that it is a very expensive operation when it is necessary to stop a long freight train in order to set out a car with a hot journal or some other minor defect. This not only delays the freight in the car but results quite frequently in overtime of road crews, and in some cases interferes with the operation of superior trains.

With this information at hand from day to day by watching the line we can determine at a glance when our cripple cars set out are increasing, and can get into the matter with a view of remedying the cause before the matter becomes too old for an intelligent investigation.

W. W. WARNER,
Works Manager, Erie Railroad.

Why Have Attractive Colors Been Scrapped?

WASHINGTON, D. C.

To THE EDITOR:

I was greatly interested in your editorial in the *Railway Age* of May 5 on the decision of the Interborough Rapid Transit Company to paint the rolling stock of the New York elevated railways a "goldenrod orange" color.

As you mentioned, the "elevated lines antedate the subways by many years," and until about twenty years ago were operated by steam locomotives. During the 'eighties at least some of the engines and cars were painted a bright green and made a very handsome appearance. Later the standard color for locomotives and rolling stock was changed to a tuscan red, similar to that now used by the Pennsylvania. While not as bright as the green color above referred to, the red equipment was very attractive and the locomotives were neatly striped and finished.

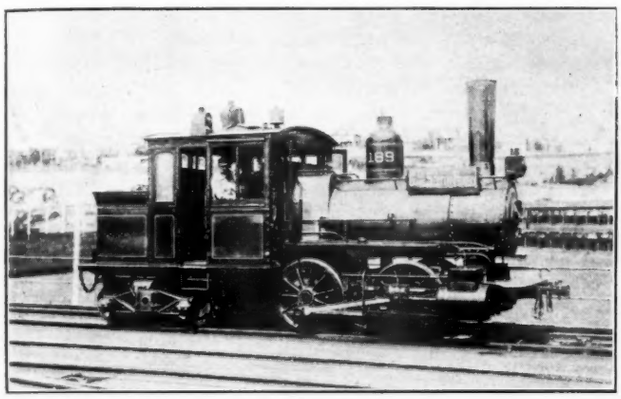
A few years ago I contributed three or four pictures of elevated engines to the Interborough Bulletin, and in commenting on them, S. D. Smith of the I. R. T. said:

"The 282 is of the type of the 25 on Second avenue as Mr. Boutell states and (they) were known as the 'green ones.' They were the best of their kind at the time they were run on Second avenue and were able always to lead the procession and went up and down Second avenue daily looking as saucy as pay cars, and when an engineer got an opportunity to grab off one of these engines to run, he grabbed it like a car tinker grabs his pay check. * * *"

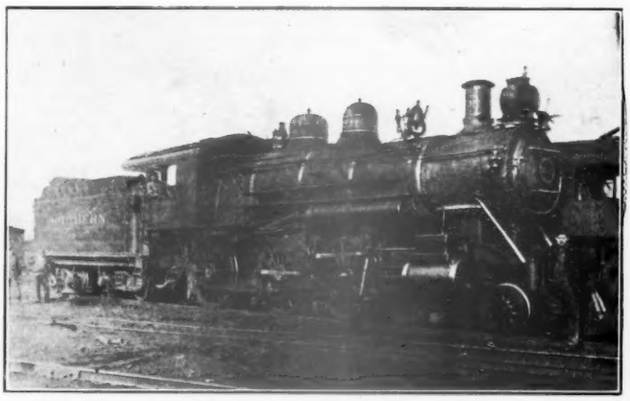
While I have no authentic information on the subject, I am reasonably sure that the colors adopted for the road's early equipment were chosen with the idea of making the cars and engines look attractive to the public, thus in a measure helping to overcome the prejudice which then existed in some quarters against the elevated system.

A similar antagonistic feeling appears to exist today, but instead of being confined to elevated roads in our large cities, it is breaking out against the trunk lines in the rural districts! Whether clean, attractive equipment will help to smooth out this situation, I shall not attempt to say, but such a conclusion does not seem unreasonable.

The accompanying photograph of one of the old Sixth avenue "Forney" locomotives may interest some of your older metropolitan readers. The neat and businesslike appearance



Neat Little Locomotives Like This One Made Friends for the New York Elevated



A Resplendent Locomotive on the Southern—a Comparatively Recent Photograph

Photographs by Courtesy of H. G. Boutell

A Lustrous Train of Several Decades Ago—the "Pennsylvania Limited"

of the road's equipment at that time, as illustrated by this little engine, is evident at a glance.

Progress has thrust aside the "Forney" engine on the elevated, the "American" type on our main lines and the wooden coach on our through passenger trains, but was it necessary to scrap likewise the attractive finish which belonged to this earlier equipment? I am glad the Interborough Company realizes that there is no connection between the two.

HUGH G. BOUTELL.
Associate Engineer, Bureau of Standards.

Government Owned Equipment

RIVERSIDE, ILL.

TO THE EDITOR:

A suggestion has lately been made that the federal government buy a large amount of cars and locomotives, and in periods of heavy traffic, lease this equipment to the individual carriers.

At first thought this seems a very good solution of the recurrent car shortages that cause so much complaint, particularly from the agricultural districts. But on closer inspection, the plan seems another effort to help the farmer at the expense of the whole country. Equipment purchased by the government will have to be paid for by taxation, and on account of the rental charge the railways will naturally use this equipment only when hard pushed for cars and it will be returned to the owner as soon as possible, thus insuring a great deal of idle time for the government cars.

The railways, if left to themselves, will provide equipment adequate to their normal needs as evidenced by their purchases of the past year, and they will naturally be more interested in maintaining their own equipment than that of another owner. They have always made an effort, consistent to their earnings, to keep their equipment in good order and have a surplus ready to meet seasonal demands. Suppose the government furnished cars necessary to move the whole wheat crop the instant it was harvested. This would result in a congestion at all the large primary markets and probably a sharp decline in the price of wheat, as the buyers could not handle such a flood of grain in the six weeks or two months of the harvest season. And why should the farmer expect to sell his whole crop at maturity when it is to feed us for a year? Would it not be wiser to sell it in smaller quantities, according to the demand of consumers, thus insuring a higher market? A manufacturer or an oil producer, for instance, does not throw his year's production on the market in a lump, but sells it steadily through the twelve months.

The railroad business like any other can be operated more efficiently and economically if seasons of unusual demands on the facilities can be avoided. Congestions of any sort are unhealthy and costly. Therefore, if the railways owned, or were furnished with, enough equipment to move crops at the moment of their harvesting, we would have a condition similar to that of the war time when thousands of cars were tied up at the Atlantic ports because of lack of unloading space and ocean tonnage.

The government is supplying the farmer with the necessary funds to carry on his business, which without doubt, is the most important in the country, so the logical thing for him to do is to organize on a business basis. By providing storage space for crops on the farms and at primary shipping points the flow of his products to the market could be regulated and in time some of the middlemen who benefit neither producer nor consumer might be eliminated. The railroads having a steady and reliable flow of business could handle it more economically than they handle a seasonal business, and could gradually reduce their charges which are much complained of by the farmer.

J. A. PERKINS.

Interest of Insurance Companies

ELIZABETHTOWN, N. Y.

TO THE EDITOR:

I am neither an officer nor an employee of any railroad, although I subscribe to your paper in which I find much of interest. Like every business man in the country I am vitally interested in the railroads. Like every household in the country, be it ever so humble, we have a vital stake in the prosperity of the railroad.

There is not a household in the United States, of which any one member saves any money at all, that is not financially interested in the railroads and will not be financially injured if the plans of Messrs. La Follette, Brookhart, Capper, et al go through in the next Congress. I give these gentlemen the credit of knowing this to be a fact, but I also credit them with astuteness to realize that 90 per cent of the households in the country do not realize the truth. Therefore, the so-called radicals can go ahead making political capital out of the railroad interest with no damage to themselves. Here lies the real danger of the situation and it has always been a surprise to me that neither the railroads nor the great insurance companies nor the savings banks have ever made any effort to spread the truth to the discomfiture of the politician.

Leave out all the stockholders, assert, which is not the truth, that their investments have no moral right to consideration, you still have a staggering mass of railroad bonds, car equipment notes, station bonds, joint terminal bonds and so on . . . a list longer than this letter. Who owns those securities? Who is dependent upon the income derived from these bonds and notes? The answer is the savings banks, trust funds, and insurance companies of the country. Does any ordinary man stop to think that if all these wonderful schemes for wrecking the roads for the supposed interest of any one class or section of the country are successful, his savings are either impaired or lost and his insurance policy of doubtful value? I have put that proposition to many men, from the farmer through the artisan, to the railroad employee himself, and I have yet to find a single individual to whom the thought had even occurred. I saw the other day that the president of some insurance company in Chicago stated how many millions his company had invested in railroad securities and what the destruction of the roads' credit had already meant to his policyholders.

Why do not the railroads and the life insurance companies and the bankers unite in a public demonstration of this truth? The figures are easily available from the annual reports of the life insurance companies and banks. Why not publish the truth? The figures would stagger the country and take not a little wind out of the sails of those politicians who live on false assertions and then the stirring up of baseless discontent.

I imagine that the "write down" of the large insurance companies on railroad bonds and securities held in recent years has been so appalling that they have selected the ostrich-like course of hiding their heads in the sand and concealing the truth. Nevertheless, they owe it to their policyholders to disclose that truth, the more so now that the Transportation Act has given the roads a chance and their securities are slowly and painfully regaining a little credit.

The plain statement of fact would put the average man squarely on the side of the roads for in the individual case the danger of losing his savings through confiscation, under whatever name, of railroad securities held by his insurance company and his saving bank would bring that voter around in a hurry. Nothing will stop political clamor like an obviously unpopular issue. The railroads have an opportunity to make attacks on them unpopular and that is worth tons of statistics as to their accomplishments and tons of argument as to their condition in reference to the prosperity of the country.

W. H. H.

Storage Battery Cars on the Canadian National

Cars Maintain Schedules Which Would Be Difficult for Steam Trains—Operating Costs Are Low

By E. B. Walker
Electrical Engineer, Canadian National Railways

THE FIRST storage battery car operation on Canadian railways commenced on May 16, 1921, when car No. 15801 started an hourly service between Trenton, Ontario and Belleville more as a mechanical test than with any regard to traffic needs. The population of Belleville is 12,240 and of Trenton 5,500 and the distance between the towns is 11.4 miles.

When the service was started there were seven trains a day in each direction on the steam railways and a number of buses on the highway. Ten normal trips a day were made by the battery car with an additional round trip on Saturday.

The novelty of the service first attracted attention and brought sufficient traffic from the outset to pay expenses, but instead of decreasing as the novelty wore off it steadily increased until a month later, there were often more than 500 revenue passengers a day. The schedule speed of this operation was 20 minutes for a single trip including three to four intermediate stops, but we were able to make the trip in a minimum of 17 minutes. The Trenton-Belleville run was continued for a month with a reliability of performance that established the battery car as an entirely satisfactory operating unit.

On June 27, 1921 the car was started on a schedule run between Bathurst, New Brunswick and Campbellton, replacing a steam train. The distance between the towns is 63 miles and one round trip a day was made with about 18 intermediate stops. An interesting point to note here is that there were nine schedule stops and two flag stops when the service was started, but the ease in starting and stopping the car soon led to a gradual addition in the number of flag stops until a total of 18 was reached. The schedule allowed 2 hrs. and 50 min. for the trip although it was found that this could easily be reduced to 2½ hours if necessary.

This operation was continued with remarkable reliability through winter and summer until September, 1922, when the car was removed to a new service between Toronto and Beaverton carrying passengers and milk. This run is 64 miles between terminals or 128 miles a day, and the schedule of 3 hrs. and 5 min. allows time for handling the milk which amounts to 120 cans on Monday morning.

Construction of the Car

The car body, built by Brill, is of simple construction as shown in the illustration. The underframe consists of two I-beams as centre sills and two channels as side sills with trussed cross members to carry the battery weight. The side posts are T-irons, on which 3/32 in. steel plates are riveted. The most important feature of the design is to obtain sufficient strength with a minimum of weight and the car designer must continually bear in mind that every extra ton means 3½ kw. hr. in battery capacity for a hundred mile run.

Car No. 15801 is Equipped with Four 25 hp. General Electric Motors, 2 Type K-36 Controllers, G. E. Straight and Automatic Air Brakes and Complete with Double Flooring, Storm Windows and Extra Battery Box Lining, Weighs 33 Tons

The trucks are Brill 69-E-2. They are of arch bar construction and are arranged for inside hung motors. The journal boxes are supplied with two Gurney ball bearings each. The Davis Steel wheels are 33 in. M.C.B. and are mounted on 4½ in. axles and have a wheel base of 5 ft. 6 in.

These trucks appear of light construction when compared with the type usually designed for interurban electric cars of similar size, but it must be remembered that the service is much easier than the usual rural trolley line with heavy grades and frequent stops.

In all cases the trucks gave entirely satisfactory service until we loaded 120 milk cans all at one end, which made it necessary to add another leaf to the elliptic springs and sub-

stitute heavier coil springs. The ball bearings have given no trouble whatever.

There are four General Electric 261-A-25 hp. 250/300-volt ball bearing motors mounted in the usual manner with gear ratio 16 to 91. This motor is developed from the G. E. 258 600-volt safety car motor. A standard series parallel controller and circuit breaker is installed at each end, and in the baggage compartment there are an ammeter, voltmeter, ampere-hour meter, underload circuit breaker and switches for the control of the battery compressor and lighting.

The storage battery consists of 250 cells of type A-12-H Edison assembled in trays of 5 cells each and arranged in the battery boxes under the floor, as shown in the illustration. The capacity of the battery is 450 ampere hours at an average of 300 volts or 135 kw. hr.

We have found it possible, however, to obtain 580 amp. hr. from these cells on emergency with a minimum of about 150 volts. This additional capacity has proved useful in winter when heavy snow drifts are encountered.

The lighting is furnished by ten of the main battery cells, which can be cut off from the power circuit by a double throw switch and consequently prevent the fluctuations in the power voltage from affecting the lights. The ten cells supply 12 volts for the 15-watt lamps inside the car as well as the two Golden Glow headlights, markers, classification, and number lamps.

General Electric straight and automatic air brakes are installed so that the car can be operated in any train, or can furnish air for one or two trailers. A motor driven compressor is installed in a compartment in the centre of one row of battery boxes and the usual air whistles, air operated locomotive bell, air sanders and hand brakes are also provided.

A Peter Smith forced draught hot air heater is installed in the baggage compartment and the fan motor is provided with a double throw switch giving full or half speed by means of a centre tap in the battery circuit.

Battery Charging

Direct current at 250 or 500 volts can be used for charging and the car is equipped with switches for arranging the battery cells in either series or parallel depending on the available voltage.

For the Trenton-Belleville run a 75-kilowatt 250 volt motor generator set, which was on hand was temporarily installed near the station. This allowed charging at the normal rate of 90 amps. at night and gave sufficient capacity for three "boost" charges during the day of 150 amps. These figures are of course doubled with the battery connected in two groups in parallel.

For the Bathurst-Campbellton run the car was first charged at night at Bathurst only from a 75 kw. 250-volt motor generator set. We found, however, that when snow came there was insufficient battery capacity to make the round trip of 126 miles on a charge so the Trenton set was moved to Campbellton and the car recharged there during the lay-over.

For the Toronto-Beaverton run the car is charged at night from a motor generator set made from a 70-hp. 900 r.p.m. 60 cycle induction motor, coupled to a 50-hp. 500-volt direct current motor used as a generator. During the day it receives a boost charge from the 600 volt street railway circuit through a grid resistance.

For normal charging about 75 kw. should be available and 250 volts is preferable to 500 especially with a grounded circuit like a street railway. Mention is made of these different charging equipments to show that a variety of apparatus can be used for the purpose.

The time required for a normal full charge is 5 to 7 hours but higher rates can be used as long as the temperature of the battery does not exceed 115 deg. F. We have charged an empty battery in 2¼ hours with a maximum temperature of 106 deg. F.

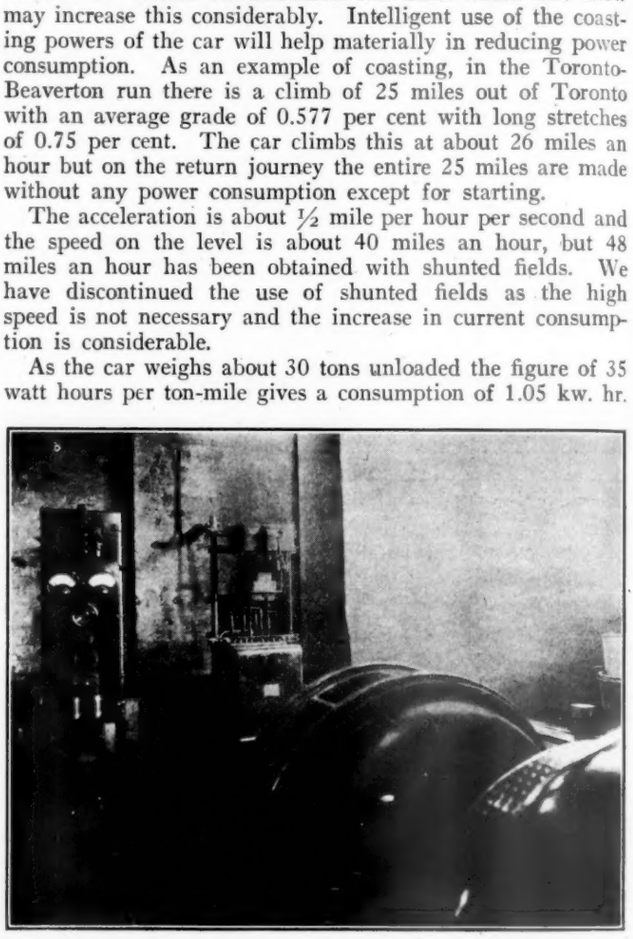
Normal Operation

The car will usually travel about 140 miles on a full charge with normal grades but it is wise to limit this to about 100 miles if possible or to arrange for a boost charge.

The consumption of power is about 35 watt hours per ton-mile under normal circumstances but head winds and snow may increase this considerably. Intelligent use of the coasting powers of the car will help materially in reducing power consumption. As an example of coasting, in the Toronto-Beaverton run there is a climb of 25 miles out of Toronto with an average grade of 0.577 per cent with long stretches of 0.75 per cent. The car climbs this at about 26 miles an hour but on the return journey the entire 25 miles are made without any power consumption except for starting.

The acceleration is about ½ mile per hour per second and the speed on the level is about 40 miles an hour, but 48 miles an hour has been obtained with shunted fields. We have discontinued the use of shunted fields as the high speed is not necessary and the increase in current consumption is considerable.

As the car weighs about 30 tons unloaded the figure of 35 watt hours per ton-mile gives a consumption of 1.05 kw. hr.



Very Simple Equipment is Required for Charging the Car Batteries

per car mile, which, of course, varies with the load, grades, windage, track conditions, etc.

In estimating the cost of charging current, 2½ to 3 kw. hr. per car mile should be allowed at the alternating current side of the charging set to allow for the above variation and for the battery and motor generator set inefficiencies.

Winter Operation

Fear was expressed that low winter temperatures would so reduce the capacity of the battery that operation would be unsatisfactory. We found, however, that the heat inertia of the large battery in well lagged compartments was quite sufficient to maintain reasonable temperatures when standing even in the coldest weather and during operations the temperature increased due to internal resistance losses.

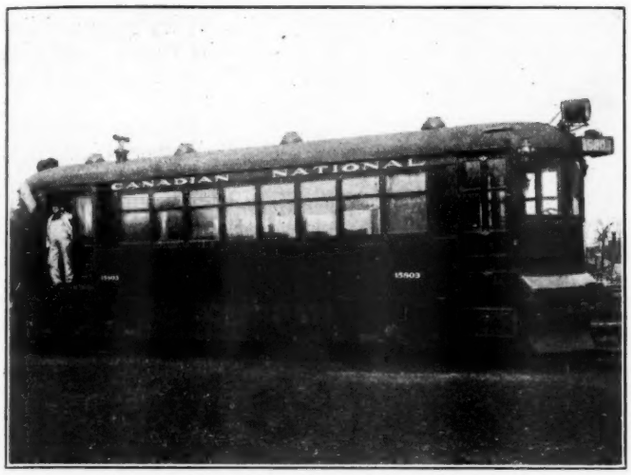
As an example of our winter operating conditions I cannot do better than quote from a report made by the electrician in charge of the car:

"On Monday, January 23, we struck a very severe wind storm on trip west. The temperature was between 20 and 30 below zero. The snow drifted badly and some places the drifts were 3 feet high. Although the drifts were frozen hard we managed to get through them all successfully and caused great surprise at Campbellton, as it was not thought

that the car would be able to get through. We arrived at Campbellton 30 minutes late but as the local delayed us 14 minutes we were therefore only 16 minutes later than our running time; also we were 470 amp. hr. discharged. I notice the hard drifts bent the pilot slightly.

"At night we were badly blocked by limited and local, more especially the latter. The local I understand was finally pushed in by a freight as the water pipe between tender and engine got frozen. We arrived at Bathurst one hour and 35 minutes late but actually we made up time.

"The temperature is still remaining around 20 below, but we are making our running time O. K. Last night we were



Car No. 15803 is Equipped with Four 21 hp. Westinghouse Motors, 2 Type K-35 Controllers, Westinghouse Air Brakes with Emergency Feature and Weighs 25 Tons

blocked 27 minutes by limited at Eel River but we arrived at Bathurst on time."

Throughout this winter the car has operated without a failure between Toronto and Beaverton, although the snow has been unusually heavy.

Trailer Operation

The car has a tractive effort of about 2400 lb. at the one hour rate. As an experiment it easily pulled a trailing load of 208,000 lb., although it is not intended for such service.

On one occasion we pulled a 25-ton trailer with ordinary bearings from Bathurst to Campbellton, making all stops; there was no difficulty in maintaining schedule and we were able to make up 10 minutes lost waiting for a meet.

At the end of the run the battery was 450 amp. hr. discharged and the temperature of the commutators was only 85 deg. F. with an outside temperature of 60 deg. F. This shows that the motors are of ample capacity for a trailer, although it would be advisable to equip the trailer with ball bearings and make it as light as possible, as the miles per charge are almost proportional to the weight.

A better type of two-car train consists of two battery cars with multiple unit control.

Battery Maintenance

The Edison battery is easy to look after if the cells are kept clean and dry and flushed regularly with distilled water. They lose capacity if not in service but a cycle or two of charge and discharge will soon bring them back to normal. Overcharges at high rates every week or two seem to keep the battery voltage at a higher average than can be obtained by the normal charge only.

The maximum life of the cells is difficult to ascertain. The battery on car No. 15801 is five years old and is over the rated capacity; we also have cells which have been 10 years in this class of service and which give full catalogue rating. It seems safe to estimate a useful life of at least eight to 10 years with normal care and conditions.

Cost of Operation

The cost of operation varies so greatly with local conditions, cost of electric power, wages, etc., that no general figure can be given but it is easy to estimate the cost for any particular operation from the following:

(1) Electric power should be estimated at 2½ to 3 kw. hr. per car mile (30-ton car) at the alternating current side of the charging set.

(2) Wages of crew will have to be added according to local conditions.

(3) The partial services of an electrician for flushing the batteries, and inspection will be required.

(4) Car maintenance and supplies, this should be from 2 to 3 cents per car mile.

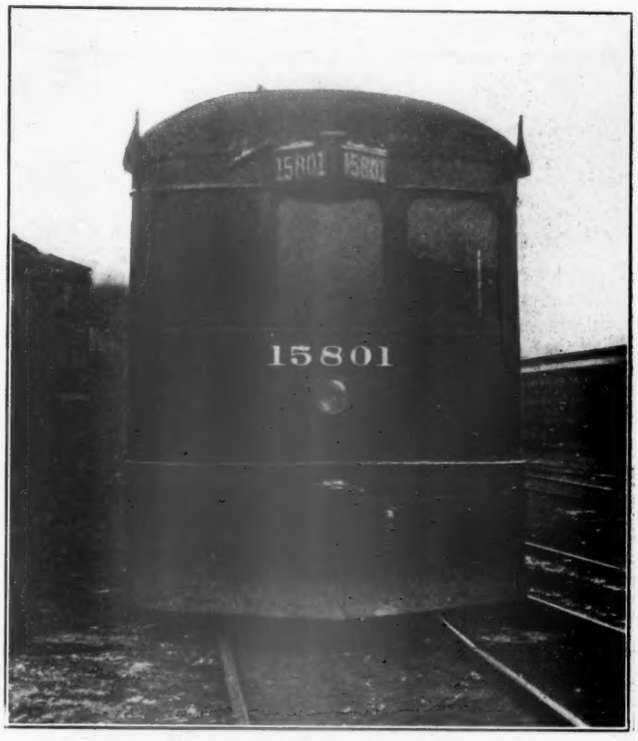
(5) Depreciation should be included at 10 per cent for the battery and 5 per cent for the car body and motors.

(6) Interest.

Failures

Since the car was put in operation there have been two interruptions due to electrical defects and three or four due to insufficient charging.

The first electrical trouble was caused by a trailing lead



End View of Car No. 15801

rubbing on the armature of one of the motors which caused a burn-out. The car operated in an entirely satisfactory manner for two or three weeks with one motor cut out while the armature was being repaired.

The second electrical trouble was caused by a grounded cell while charging from the 600 volt street railway system. We do not know what started the ground but suspect that it was due to careless flushing. The result was that the grounded cell punctured and spilled the electrolyte which caused other cells to ground. Three cells in all were injured in two different trays. Seeing smoke from the battery compartment the yardmaster cancelled the run and sent out a

steam train, although, had the electrician been advised in time, it would have been a simple matter to cut out the injured cells and operate the car as usual, which was actually done for the next day's run.

The charging failures were mostly due to an old steam driven generator at Campbellton which broke down more than once, which resulted in the installation of the motor generator set referred to elsewhere.

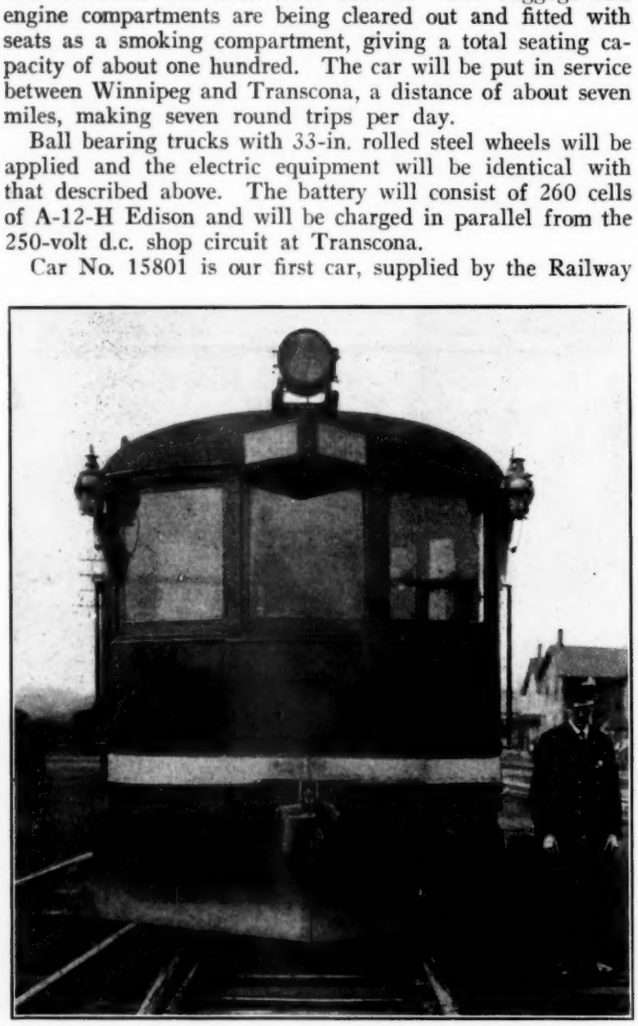
The only other charging failure was due to somebody who turned the ampere hour meter back to zero by hand, with the result that the charge was shut off before completion.

Battery Cars Now in Service

Car No. 15800 is an old gas electric car which is being remodeled. The body is of steel of similar construction to that already described but it is 60 ft. long by 10 ft. wide and the seats will hold three abreast. The baggage and engine compartments are being cleared out and fitted with seats as a smoking compartment, giving a total seating capacity of about one hundred. The car will be put in service between Winnipeg and Transcona, a distance of about seven miles, making seven round trips per day.

Ball bearing trucks with 33-in. rolled steel wheels will be applied and the electric equipment will be identical with that described above. The battery will consist of 260 cells of A-12-H Edison and will be charged in parallel from the 250-volt d.c. shop circuit at Transcona.

Car No. 15801 is our first car, supplied by the Railway



End View of Car No. 15803

Storage Battery Car Company, and described above. The seats in the smoking compartment shown in the illustration have been removed to give sufficient room for the milk cans, service between Toronto and Beaverton will be continued.

Car No. 15802 is a Brill car similar to No. 15801 but slightly shorter. It seats 30 in the main compartment and 20 in the smoker and has a 10-ft. baggage compartment. It is equipped with four Westinghouse V-65-A3-250-volt ball bearing motors, gear ratio 15 to 91, mounted on Brill 69-E trucks with S.K.F. bearings, and 30-in. chilled iron wheels. This is a similar truck to the 69-E-2 but the wheel base is 4 ft. 6 in. instead of 5 ft. 6 in. and the motors are outside hung. Westinghouse air brakes and compressor are installed, Peter Smith heater and other details similar to car No. 15801. The battery consists of 270 cells of A-12-H Edison. This car will be put in service on the Bathurst-Campbellton run formerly furnished by car No. 15801.

Car No. 15803 is of identical construction to No. 15802 but it is only 36 ft. 6 in. long, over end sills and seats 30 passengers in the main compartment and with a few folding seats for smokers in the baggage compartment. The motors and trucks are identical with car No. 15802 but the gear ratio is 22 to 84 to allow the use of a lower voltage battery. The battery consists of 110 cells of M V X-33 Iron Clad Exide battery. Half of the cells are under the seats and the remainder are in the usual battery compartments under the floor. This battery has a capacity of 544 amp. hr. at an average of 215 volts or 117 kw. hr.

It is in service between Brockville and Westport and runs 107 miles per day on one charge. The grades on this section are heavy and reach a maximum of 1.77 per cent.

The car is charged at night from a motor generator set in the Brockville roundhouse. The set has a capacity of 57 kilowatts at 275 volts and the battery is charged with all cells in series. By charging at night only, advantage is taken of the off peak power rate, which is 35 per cent less than the day rate.

Car No. 15804 is under construction at our St. Catharines shops and will be 60 ft. long to seat 60 with a 10-ft. baggage compartment. The electrical equipment will be identical with car No. 15800. No run has yet been assigned to this car.

Comparison of Batteries

Comparison of the relative merits of the nickle-iron and lead batteries have been made very fully by various authorities and it is not necessary to go over this again.

In brief, we have found that the nickle-iron battery will stand rough usage and give long life in battery car service and we are waiting with interest to compare results with the lead battery on car No. 15803.

The longer life of the nickle-iron battery is partially offset by the lower price and high efficiency of the lead battery, which however, has its drawbacks of greater weight; only by experience and careful records can we obtain an accurate comparison.

Engineers Report on New England Consolidations

THE committee appointed by the six governors of the six New England States to report on the general railroad problem has not yet made a report; but, on an informal request from its chairman, a committee of engineers has examined the problem in detail, and has published a comprehensive report. This committee consists of George F. Swain, chairman; Charles T. Main, Charles R. Gow, Eugene C. Hultman, D. C. Jackson and Leonard Metcalf. It represents the Council of the Affiliated Technical Societies of Boston, nine local organizations, covering the whole engineering field. The Council has adopted as its own this report of the committee, and has sent it to James J. Storrow, chairman of the governors' committee.

The report decides in favor of the proposed plan for consolidating the New England roads with trunk lines. The committee suggests, but does not formally recommend, that the New Haven should be consolidated with the Pennsylvania and that the northern New England lines be consolidated with the New York Central or with the Delaware & Hudson. The Boston & Albany, already controlled by the New York

Central, is not disturbed. Mr. Hultman presents a vigorous minority report, in which he argues at length for the establishment of an independent New England railroad system.

The majority report quotes at length from the federal law, from an essay on the subject by John E. Oldham and from the report of Professor William Z. Ripley. The argument for consolidation with trunk lines consists, in considerable measure, of criticisms of Professor Ripley's conclusions. It is declared that the New England roads are very weak financially, needing extensive improvements while yet freight rates cannot be increased without burdening the people. It is not believed that under present conditions the New England roads can secure any increase in their proportion of the revenue on through freight from or to the west. If the New England roads were to stand alone they would have to charge higher rates than in the past, and higher than other parts of the country, and this would be a severe handicap on all industries.

The Boston & Albany, controlled by the New York Central, gives satisfactory service; experience therefore proves that there is no danger in trunk line control. A trunk line owning a New England line would have a strong motive to seek New England business. By the trunk line plan the New England shipper has less choice than at present in selecting the route for his freight west of New England; but this disadvantage, if it be a disadvantage, should not interfere with an otherwise acceptable plan for restoring the efficiency and credit of the railroads. It is not believed that the establishment of a New England railroad system would result in any important reductions in operating expenses.

New England has been accused of being provincial; the best cure for this is to be firmly buckled to the rest of the country by bands of steel. The Pacific Coast is far removed from the other states but the people never think of establishing a separate railroad system.

Minority Report.—Mr. Hultman argues at length against absentee management. He maintains that the value of the New England railroads is greater than the aggregate amounts of their stocks and bonds, at par, and that a fair return on this value will restore their credit. The Interstate Commerce Commission has power to prescribe reasonable and remunerative rates. The trunk lines would not be willing to make routes other than over their own lines and thus the shipper would have a more restricted choice of routes. To consolidate with the trunk lines at this time would be selling out the New England transportation system as at a bankrupt sale. The purchasers could tax the users of the roads upon their full real value. Even if an independent New England system should prove unsuccessful, it would still be possible to consider consolidation with some trunk line.

Freight Car Loading

WASHINGTON, D. C.

LOADING of revenue freight continued to increase in the week ended April 28, during which the total loading was 963,694, an increase of 212,583 cars as compared with the corresponding week of last year and of 242,610 as compared with the corresponding week of 1921. Last year the loading did not reach this figure until the latter part of September and the loading has never been so great in any year before June. The loading of grain and grain products, live stock, coke and forest products fell off slightly as compared with the preceding week, but there was a large increase in the loading of ore, which reached the high figure of 24,135, and in miscellaneous freight, of which 356,435 cars were loaded.

For the period of approximately four months ended with April 28 the total car loading this year has been 15,094,386 as compared with 12,764,553 in 1922 and 11,838,647 in 1921. The increase over last year is over 18 per cent.

The shortage of freight cars for the period April 22 to 30 averaged only 35,282, according to reports with the Car Service Division. This was a decrease, compared with the previous period of 9,017 cars, in the face of an increase during the same period of nearly 6,000 in the number of cars loaded with revenue freight. The shortage in box cars was 13,940, a decrease since April 22 of 5,409, while the shortage in coal cars was 17,634 or a decrease within the same period of 3,091 cars. The shortage in stock, coke and refrigerator cars has practically disappeared. Surplus freight cars in good repair totaled 13,556 or an increase since April 22 of 2,494. Locomotives in bad order on April 15 totaled 14,850, or 23 per cent of the total number on line. This was an increase of 398 over the number on April 1. Of the total, 13,172 were in need of repairs requiring more than 24 hours, which was 20.4 per cent of the number on line. This was an increase of 371 over the number in need of such repairs at the beginning of the month. Reports also showed 1,678 or 2.6 per cent, in need of light repairs, an increase of 27 during the same period.

REVENUE FREIGHT LOADED

SUMMARY—ALL DISTRICTS, COMPARISON OF TOTALS THIS YEAR, LAST YEAR, TWO YEARS AGO—WEEK ENDED SATURDAY, APRIL 28, 1923

Districts	Year	Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Mdse. L.C.L.	Miscellaneous	Total revenue freight load	Corresponding period	
										1923	1922	1921
Eastern	1923	6,595	2,870	56,504	4,262	6,502	3,678	65,766	99,987	246,164	.....	.....
	1922	6,765	2,955	7,617	1,255	5,384	1,404	69,270	81,044	.....	175,634	178,893
Allegheny	1923	2,118	2,639	52,499	7,695	3,878	6,228	48,453	92,322	215,832	.....	.....
	1922	2,141	2,579	12,733	4,236	2,597	2,574	51,043	67,109	.....	145,012	144,157
Pocahontas	1923	200	81	24,431	611	1,904	174	6,261	5,409	39,071	.....	.....
	1922	190	82	26,565	241	1,344	32	6,163	4,469	.....	39,086	29,813
Southern	1923	4,256	1,864	21,477	1,337	24,858	1,622	39,254	44,842	139,562	.....	.....
	1922	3,098	2,160	19,268	564	19,008	816	37,224	42,177	.....	124,315	110,214
Northwestern	1923	9,091	8,065	4,300	1,235	21,189	8,711	31,086	38,583	122,260	.....	.....
	1922	10,015	8,224	4,241	1,411	17,815	6,807	30,270	31,790	.....	110,573	93,814
Central Western	1923	10,366	13,612	16,812	461	10,172	3,152	35,704	52,397	142,716	.....	.....
	1922	10,352	11,720	3,707	169	6,129	1,584	34,532	40,236	.....	108,429	106,703
Southwestern	1923	4,234	2,572	4,104	128	8,742	530	14,864	22,895	58,089	.....	.....
	1922	3,697	2,478	1,258	144	6,593	673	13,663	19,556	.....	48,062	57,490
Total western districts	1923	23,711	24,249	25,216	1,824	40,103	12,433	81,654	113,875	323,065	.....	.....
	1922	24,064	22,422	9,206	1,724	30,537	9,064	78,465	91,582	.....	267,064	258,067
Total all roads	1923	36,922	31,703	180,127	15,729	77,255	24,135	241,388	356,435	963,694	.....	.....
	1922	36,198	30,198	75,389	8,020	58,870	13,890	242,165	286,381	.....	751,111	.....
	1921	34,097	29,727	143,860	4,777	48,085	7,776	216,187	236,575	.....	.....	721,084
Increase compared	1922	724	1,505	104,738	7,709	18,385	10,245	.....	70,054	812,583	.....	.....
Decrease compared	1922	.....	.....	.....	.....	.....	.....	777	.....	.....	.....	.....
Increase compared	1921	2,825	1,976	36,267	10,952	29,170	16,359	31,201	119,860	242,610	.....	.....
Decrease compared	1921	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
April 28	1923	36,922	31,703	180,127	15,729	77,255	24,135	241,388	356,435	963,694	751,111	721,084
April 21	1923	38,125	33,317	179,762	16,010	80,140	19,903	238,520	351,966	957,743	706,137	704,632
April 14	1923	39,329	30,319	182,356	16,014	77,313	18,296	238,636	344,496	946,759	700,155	702,116
April 7	1923	39,353	30,883	164,089	16,076	73,957	15,381	234,208	321,820	895,767	706,013	694,881
March 31	1923	41,842	31,726	182,668	15,740	76,124	15,435	235,695	359,495	938,725	821,808	663,171

Increases in Wages of Trackmen, Clerks and Others

THE GRANTING of increases in wages to the maintenance of way employees of the Atchison, Topeka & Santa Fe and to the clerical employees of the Wabash, has been announced during the past week. In addition, requests for increases from four New England lines were received by the Labor Board.

The Atchison, Topeka & Santa Fe has granted increased wages to its maintenance of way employes and shop laborers ranging from one half to 2½ cents an hour. The wages of section foremen receiving less than $116.60 a month will be advanced to that figure and an increase of $2.04 monthly is given to those now receiving the former sum, or more. Assistant section foremen, construction foremen and their assistants will receive an increase of 2½ cents an hour and mechanics in the maintenance of way department, two cents. Mechanics' helpers in the maintenance of way department, track laborers except those on the Gulf, Colorado & Santa Fe, bridge tenders and shop laborers will receive an increase of one cent an hour. Track laborers on the G., C. & S. F. have been granted an increase of one-half cent an hour. The agreement, which was negotiated between the Santa Fe and the United Brotherhood of Maintenance of Way Employees and Railway Shop Laborers on May 1, will remain in effect until May 1, 1924.

An increase of three cents an hour for clerical employees on the Wabash, was announced on May 3. This revision in wages affects 2,300 employees, the minimum rate for this class now being 51 cents an hour.

The clerks employed by the Boston & Albany, said to number 1,600, have appealed to the Labor Board a controversy with the management involving an approximate increase of 20 per cent in their wages. Similar appeals from the clerks of the New York, New Haven & Hartford, the Boston & Maine, and the Maine Central are expected.

Concerning wages of clerks, it is understood that as yet there have been no referendums by the clerks of individual lines on the question of approving the demands for wage increases which were voted recently by the general chairmen of the union. It is believed that such a vote will be taken on all the roads before the day set for the conferences, at which the question will be taken up by the managements and the representatives of the employees. It is considered probable that there are a number of roads on which the clerks will signify their unwillingness to be represented by the national organization.

A continuation and possible intensification of the trouble between the Pennsylvania Railroad and the Labor Board is indicated by a citation of the railroad to appear before the board on May 21 for investigation as to whether or not it has violated the orders of the board in refusing to recognize the Brotherhood of Railway and Steamship Clerks in the election on the road to select employee representatives to negotiate wages and working rules. The clerks have been awaiting the settlement of the shopcrafts case by the Supreme Court before bringing the controversy to the Labor Board. The board will begin the consideration at once of 169 cases of Pennsylvania employees against the road, which have also been awaiting the disposal of the shopcrafts case. The board will defer action on the Pennsylvania's failure to comply with the board's decision in the shopcraft's case until the three new members of the board have been appointed by President Harding.

An amicable adjustment of the dispute concerning wages and rules between the Order of Railroad Telegraphers and the Illinois Central has been reached following a series of conferences. The dispute arose over a decision last December by the Labor Board which adjusted the scale and changed the method of computing wages for the telegraphers.

The train dispatchers on the Chicago & Eastern Illinois have been granted $9.04 a day, effective May 1, and effective for one year. The maintenance of way employees and shop laborers on the Buffalo, Rochester & Pittsburgh have received increases as follows: Ditching and derrick engineers, $10 monthly; pile driver engineers, 70 cents an hour; bridge and building mechanics, increased four cents an hour; carpenter helpers, one cent an hour; mason helpers, 3½ cents an hour with minimum rate of 47¾ cents an hour; track laborers, three cents an hour; shop laborers, three cents except transfer table operators, who have received an increase of seven cents an hour; pumpers, $5.12 a month; pile driver firemen and watchmen, $6.12 a month; watchmen, $3.12 a month; cooks, $6.26 a month. Building and section foremen have received an increase of $9.80 a month. Rates of $112 a month for assistant track foremen and $133 a month for assistant carpenter foremen have been established.

The Lehigh Valley has granted increases of approximately three cents an hour to freight handlers, laborers, clerks, office and station employees.

The Portland Terminal Company has granted an increase to longshoremen of five cents an hour straight time and seven cents an hour overtime.

On the Long Island road laborers in the construction, stores, shops and maintenance of way departments at the western terminals have been granted an increase of three cents an hour; and truckers, stevedores, coopers, callers and checkers at the same points have been granted one cent an hour increase.

The Boston & Maine has granted increases to maintenance of way employees as follows: Section foremen and assistant foremen, three cents an hour; track and common laborers with more than six months' experience, three cents an hour; shop laborers and storehouse laborers, three cents an hour.

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If He Wants to Start a Hot Fire We'd Say That Would Do It—But Look Out for the Rest of the Dishes

Chamber of Commerce Discusses Transportation

National Organization Studies All Phases—Progress Reports of Special Committees

TRANSPORTATION was one of the major topics at the annual meeting of the Chamber of Commerce of the United States which was held in New York on May 8, 9 and 10. Highway and waterway transportation, as well as railroad, were considered, together with suggested means of co-ordinating the three.

Many phases of the railroad problem were considered, among them: Pool car shipments and store-door delivery, effect of freight rates on production costs, credit requirements of the railroads, the farmers' interest in transportation, financial support for the railroads and the re-establishment of railroad credit.

The five special committees appointed by the Chamber of Commerce to study the transportation problem made reports of progress. These committees are assigned to the following subjects: Railroad consolidations, governmental relations, relative rates, motor transport and waterways.

J. H. Barnes President of the Chamber, Defends Railroads

Julius H. Barnes, in opening the meeting, delivered an address which was a summary of economic conditions throughout the world. Speaking of transportation in this country, he said:

"In America, the point of immediate attack against our national philosophy of private enterprise and private initiative has centered around railroads. The dependence of community life and of industry existence, and the contact of every individual with these great channels of service, make them peculiarly the subject of public discussion. The admitted and repented abuses of the early days of transportation created a public temper of criticism and antagonism which is only today being replaced by a better understanding of the great national service history of these roads, and a fairer appreciation of the methods by which they can be developed in the national interest.

"American judgment is fundamentally fair when fully informed, and it has recognized the injustice of condemning insufficient expansion and inadequate equipment, when the primary cause for that rests in the public's own misuse and abuse of proper regulation, in the past. American judgment is also sound, when fully informed, and there is distinctly less tendency to rush to government ownership and government operation, which has under trial elsewhere written its relative inefficiency and failure. There is manifestly a general desire to perfect the peculiar American policy of regulation in the treatment of these great facilities, and a growing conviction that, in its own national interest, that regulation must be wise and generous.

"Manifestly also, a national policy of regulation, to be wise and generous, must have accurate information and informed recommendation in the formulation of policies. Manifestly also, transportation, which is the life-blood of national life, must be studied and developed in several wider aspects than railroad development alone. The possession of 2,500,000 miles of publicly-owned highways, of which probably 400,000 miles are now hard surfaced roadways, open to freight and passenger carriage, suggests a new field of intensive study. The development in twenty years of the motor truck, until last year the actual tonnage lifted by this newly developed vehicle exceeded 50 per cent of the actual tonnage of all the railroads combined, suggests the necessity of properly relating this new form to the older lines, which must always be the backbone of long-distance transport. The conviction of our people as to the potential service of waterways, stimulated by the development on the Great Lakes of the cheapest water transport in the world, forces into a comprehensive study of transportation a consideration of the proper relation of water transport to these other forms."

Hoover Speaks of Transportation Shortage and Asks for Co-operation with Railroads

Herbert Hoover, secretary of commerce, addressed the meeting on the industrial and financial situation in the country with special reference to means for safeguarding prosperity. Of the railways, he said:

"One of the great wastes in our economic machine is the shortage of transportation. It is the most profound and far reaching deterrent upon our growth. It imposes great costs upon production.

"I need not point out to you that the periodic car shortage in its real meaning of insufficient tracks and terminals, as well as rolling stock, imposes intermittent stoppages of our industries and intermittent strictures in the law of supply and demand, influences price levels and creates local famines and gluts.

"It imposes burdens upon us which I believe every year create commercial losses equal to the entire capital cost of bringing the transportation system up to national need. It would be easy to demonstrate that in the additional price of coal due to insufficient transportation during the past year we have paid more than the equivalent of a 50 per cent increase in freight rate on coal. At times last fall there was a differential of 8 to 15 cents per bushel on export grain solely because of inability to secure free movement to seaboard.

"The causes of shortage are not far to seek. While the war contributed much delay and demoralization, the continued strangulation of railroad finances alone, before enactment of the present transportation law, could have brought us only one result.

"Nor is this a criticism of the railways for they have grown in detailed working efficiency with the rest of the country. In a decade they have increased the movement of goods by 15 per cent with an increase of 3 per cent in personnel. Moreover the managers are showing great faith and courage in the undertaking of a large program of expansion. It is not my purpose to discuss the ultimate solution of the railway problem here. I have participated with the president of your chamber in appointing a series of committees comprising representation from the railways, the motor industry, the shippers, the waterways, the farmers and labor. These committees, as you know, are devoting themselves to a full consideration of the complex issues involved and their conclusions will, I believe, be one of the utmost value to the government in advancement of solution.

"There is a matter of immediate importance in which the commercial public can be of the utmost assistance in transportation and at once. Pending a large amount of betterments the railways are overtaxed to handle the vast volume of commodities we are producing and consuming even today. The continuance of our prosperity depends upon their handling the full load. With the continuation of business volume their burden will be even greater next fall than ever before. Therefore, a great service can be given if every local chamber will definitely organize to co-operate with every local railway official toward this end. Particularly can the whole com-

munity assist if it stocks its coal between now and September so as to relieve the fall and winter traffic. This is equally in the interest of the coal consumer for with the present volume of business and the crop outlook he would be farsighted who emulates the wise virgin and fills his lamp now instead of clamoring at the government when there are not enough cars to go around."

Markham Discusses Co-ordination of Various Agencies of Transport

C. H. Markham, president of the Illinois Central, delivered an address on the Co-ordination of Railroads, Waterways and Highways.

"Proper co-ordination demands," he said, "that the service be performed in each instance by that means which can render it most economically." He emphasized the impossibility of determining just what agency is the most economical in a given instance when waterways and highways are open to vessels and motor trucks virtually free of charge, being subsidized by the public which provides and maintains a right of way for them, whereas the railways must provide and maintain their right of way out of rates. The rates charged by water and highway lines are sometimes lower than the rail rates, not because the real cost to the public is less but because part of the bill is paid in taxes.

"The subsidy of competing forms of transportation from funds raised by taxation works a particular injustice upon patrons of the railroads," he continued. "The taxes paid by Class I railroads last year amounted to more than $800,000,000, as compared with less than $100,000,000 in 1911. The railroads have no other sources of revenue, hence the funds to meet their tax bills have to come out of the purses of their patrons—those who pay freight and passenger rates. Supporting competitive transportation upon an artificial basis by means of taxation at the expense of the railroads and their patrons is false economy."

He suggested as a solution the construction of comparatively short stretches of hard-surfaced roads designed and designated primarily for the use of motor trucks. "These roads should," he said, "be constructed only where commercial and other conditions are favorable to the use of trucks in transporting goods for short distances and where the saving as compared with rail transportation is sufficiently large to justify the extensive expenditures necessary to provide the kind of highways that can be used by such vehicles." He said that motor trucks were well suited for performing transportation service in congested areas and that he looked for a rapid development in their use in this field.

"I am not opposed to water transportation wherever it can be justified on the basis of economy and practicability," he said. "In order to assist in determining the advisability of using the lower Mississippi river the Illinois Central has co-operated heartily with the officials of the War Department in the experiment which they have been making since 1918. If the experiment should eventually prove the wisdom of using the river for transportation, we believe the Illinois Central ought not to be barred by law from putting boats on the river and operating them in conjunction with its services by rail. That would be carrying out both the spirit and the letter of co-ordination."

"The co-ordination of our railroads, waterways and highways demands that the three forms of transportation be surrounded with comparable restrictions as to rates, service and safety to the public. This applies particularly to the present chaotic condition of motor vehicle operations in many states. Fewer than half of the states regulate motor vehicle carriers at all. To allow motor vehicle transportation operated strictly as a public utility to run without regulation in competition with a railway service that is closely regulated is not only opposed to the American spirit of fair play, but is detrimental to the maintenance of adequate railway service, which the public must have at any cost."

W. N. Doak, Vice-President of Trainmen, Asks Support for Railroads

W. N. Doak, vice-president of the Brotherhood of Railroad Trainmen, addressed the meeting on Financial Support for the Railroads. He said that if the amount of "time, money and printers' ink wasted by the railroads and the employees in telling of the mean things the other was capable of doing, to which could be added the efforts of other bodies and organizations in taking sides with either of them, had been put into the railroad business, we should be far along the road in the adjustment of our difficulties."

Mr. Doak spoke of the position of his organization in industrial and economic matters, saying that it believed in "fair dealing, the literal observation in letter and spirit of contracts and contractual obligations, placing above all other considerations respect for law and order and rigid observance of contracts."

He said further that the railway employees were vitally interested in the financial success of the railways and that they appreciated their interest therein. "The representative of railroad labor," he said, "who seeks to wreck the railroads financially or otherwise is not a representative of the rank and file of labor and should be retired." He appealed to financial and business men to stabilize railroad securities, putting them on a sound basis, and suggested that under such conditions railroad employees would invest widely in these securities from earnings. He asked the public not to believe rumors that the employees were trying to bankrupt the railroads every time they asked for increases in wages due to the rising living costs, and, similarly, not to give credence to reports of collusion whenever the railroads, hard pressed financially, with the aid of their employees sought increases in rates. He took a strong stand against government ownership and said that railway employees in general did not support it. He decried government regulation and proposed that differences between employees and managements could best be settled by direct negotiation rather than by the interference of a government board.

He spoke of the animosity against the railroads in rural districts and said that the money which had been spent in "miseducating" rural people about the eight-hour day could have been spent in a wiser manner; that it had served to turn the farmer against both the railroads and their employees and that consequently all are "reaping the harvest of ill-advised sowing."

Credit Requirements of the Railroads

Credit Requirements of the Railroads was the subject of a discussion by P. V. Davis, vice-president of the National City Company, at a meeting of the Finance Group.

He emphasized the danger of the inability of the railroads to finance improvements by stock issues and the consequent increase in bonded debt. He said, however, that there were a considerable number of roads which could, if need be, raise large sums by the issue of preferred stock. He expressed great confidence in the Interstate Commerce Commission and the Transportation Act.

"It will not take many years to bring our transportation system to its former efficiency if the essentials of the Transportation Act are preserved and if the commission steadily adheres to the policy of recognizing a fair return on invested capital as an integral part of the cost of transportation. I said before that the investor was not willing to take an unnecessary political risk. The danger in the railway system at present is entirely in that quarter. The political risk threatens to increase alarmingly."

He paid his respects to compulsory consolidation, said to be favored in Washington, as follows:

"The underlying idea seems to be if we can effect a series of gigantic mergers, rates can be reduced without bankrupting the weaker lines. The results, as I see them, will be the reduction of all roads to a common denominator of financial weakness and inefficient service."

Resolution Asking Effort to Restore Railroads to Profitable Position

The Transportation Group of the Chamber, meeting on Wednesday, adopted the following resolution:

"Whereas, the railroad executives inspired by an abiding faith in the American people have authorized the expenditure of $1,540,000,000, which insures a marked advance in railroad progress, and will contribute largely to the prosperity of the country, and

"Whereas, this expression of faith marks the advent of a new era in transportation development,

"Therefore, be it resolved, That the Chamber of Commerce of the United States urge upon its members and civic bodies and the public in general a united effort to quickly restore our great arteries of commerce, the railroads, to a sound and profitable position in the forefront of American business."

Progress Reports of Special Committees Investigating Transportation

The Chamber of Commerce has five special committees studying as many phases of transportation. These committees will report their findings to a general committee which will co-ordinate their ideas into a national transportation program. The special committees are just beginning to get their work under way so only brief progress reports were possible at the annual meeting.

Consolidations

This committee, of which Carl R. Gray, president of the Union Pacific, is chairman, reported briefly on the possible economies, real and supposed, of consolidations. It then told of its consideration of measures which should be adopted should consolidation actually be brought about. It is also considering the question of whether or not any modification is needed in the law governing consolidations.

Governmental Relations

This committee, of which George A. Post is chairman, spoke of the wide field covered by its survey and the great amount of data which would have to be assembled. The committee has already reached an agreement as opposed to government regulation. It is considering the rule of rate making, the Labor Board and the recapture clause.

Highway Transportation

This committee, of which A. H. Swayne, vice-president of the General Motors Corporation, is chairman, reported that it had divided itself into three sub-committees to study: the use of the motor outside the terminal area, the use of the motor in the terminal area and the legal aspect of highway transport in its relation to other carriers.

Relative Freight Rates

This committee, of which F. A. Delano is chairman, has reached the following tentative conclusions:

I. Railway rates as a whole are not high in this country as compared with railway rates in other countries. This is just as true now as it was before the World War.

II. Even though railway rates are considerably higher than the pre-war basis, they are as a whole materially lower in relation to the prices of commodities generally, as indicated by index numbers prepared by various public or quasi-public bodies.

III. It is clearly evident that no stable rate structure can adjust itself to the ups and downs of business cycles and to the varying prices of commodities accompanying these cycles and that therefore rates which may be entirely satisfactory or even low when prices are high may seem burdensome when prices are very low.

IV. While the above might indicate the desirability of a more flexible rate structure, or one more easily adjusted to price conditions, it does not follow that the evils of a flexible rate system would not outweigh the advantages.

V. The insistent demand of all interests is *primarily* for adequate and dependable service, and secondly for rates which shall be relatively fair. No demand for a general reduction in rates appears to exist at the present time. In the case of agricultural products the recent demand for a decrease appears to have been due to the fact that the prices on those products have suffered from economic conditions wholly beyond the control of the carriers.

VI. Considerable evidence has been submitted indicating that certain rates and particularly the class rates, and the L. C. L. rates, are too low, and because they do not pay the cost of service in many cases need a general readjustment; but it remains to be determined whether such an increase in these rates would be sufficient to warrant a material reduction in any large group of commodities.

Waterways

This committee, of which W. L. Clause of the Pittsburgh Plate Glass Company is chairman, reported that it was considering rail-water co-operation, including the question of through rates and service, and the scope and regulation of competitive rail and water transportation.

Other Addresses

Other speakers on matters bearing on the railroad problem were: W. Lee Cotter, Cotter Warehouse, Mansfield, O., on Pool Car Shipments; W. J. L. Banham, Otis Elevator Company, Store-Door Delivery; R. S. Binkerd, Effect of Freight Rates on Cost of Production; George M. Shriver, senior vice-president, Baltimore & Ohio, Credit Requirements of the Railroads; C. A. Newton, Congressman from Missouri, Co-ordination of Our Systems of Transportation; R. D. Chapin, Hudson Motor Car Company, Co-operation Between Motor and Railroad; A. S. Wing, Provident Mutual Life Insurance Company, Insurance Investments in Railroads; O. E. Bradfute, Farm Bureau Federation, The Farmer's Interest in Transportation; and W. W. Head, Omaha Trust Company, Re-establishment of Railroad Credit.

Valuation of O.-W. R. R. & N.

Washington, D. C.

The Interstate Commerce Commission has made public its tentative valuation report on the properties of the Oregon-Washington Railroad & Navigation Company and the Des Chutes Railroad as of June 30, 1916. The final value of the property owned by the Oregon-Washington is placed at $129,810,913 and that of the property used at $127,357,514. The property owned includes that leased to six railroad companies, which is given a final value of $8,362,313, and the property used includes that leased from three companies, including the Des Chutes, and private properties, given a final value of $5,908,914. The outstanding capitalization of the Oregon-Washington on date of valuation was $152,840,671. Its investment in road and equipment including land, as stated on the books, was $156,642,559, but readjustments suggested by the commission would reduce this to $156,505,904, of which $130,559,-

372, less an undetermined portion assignable to offsetting items recorded at $6,289,919, represents the par value of long term debt assumed or incurred, the money value of which at the time of the transaction is not known and cannot be determined. The cost of reproduction new of common carrier property other than land and material and supplies is given as $120,198,720 for the property owned and $117,619,444 for the property used. The cost of reproduction less depreciation is given as $106,605,123, and $104,124,158. The report shows 34,258 acres of carrier lands owned, which are given a present value of $15,647,344. The report also shows 8,214 acres of lands held for non-carrier purposes, which are given a present value of $4,800,665.

The Oregon-Washington owned and held cash on hand and materials and supplies in the amount of $1,903,399. The report says that this is in excess of normal requirements for working capital as determined in the manner outlined in an appendix to the report. Under the method there explained, the readjusted percentage for this carrier is 12.8, which applied to annual operating expenses of $11,317,000 ascertained from the trend of operating expenses per mile for a period of five years prior to valuation date, results in the sum of $1,448,600 as the amount necessary for the carrier's use as working capital. The remainder, $454,799, is considered for the purpose of the valuation as non-carrier property. The report also shows that the Oregon-Washington has investments in other companies held for non-carrier purposes of a par value of $1,939,482, which is also used as the book value.

Final value of the property of the Des Chutes leased to the Oregon-Washington for common carrier purposes is found to be $5,650,000. Its outstanding capitalization was $5,957,322 and its investment in road and equipment as stated in the books was $5,855,102.

How One Line Developed a Passenger Business*

By F. W. Shappert

Traffic Manager, Chicago, North Shore & Milwaukee

MY CONCEPTION of a traffic manager's job is to sell transportation, to create a market for his goods where there is none, to analyze local conditions carefully and ascertain exactly what he has to sell and then put up a strong, concise and convincing selling argument to prospective customers. To better illustrate, I will cite some specific cases of North Shore salesmanship.

Since the present management has taken hold of the North Shore, we have greatly increased the number of chartered or special cars, which now amount to several hundred special trains annually. Our traffic solicitors at Chicago and Milwaukee cultivate officials of various fraternal organizations, clubs, societies, etc., and arrange for reciprocal visits between such organizations at Kenosha, Racine, Milwaukee, Waukegan and Chicago. In almost every instance a representative of this office has accompanied the party and seen that the members have a comfortable trip. He mixes actively with the guests with a view of getting comments regarding the trip and is also keenly alert for tips regarding future pilgrimages and excursions, etc. These tips are followed up with extreme care to secure additional business.

Several years ago it was customary for a football captain, or a baseball captain, to call up the office and arrange for a small party to travel to some town along the line. Our solicitors now get in touch with the students of the various high schools, colleges and universities and write individual letters calling attention to the proposed game, working up enthusiasm that invariably produces chartered cars or special trains. I have in mind one of these trips—from Lewis Institute, Chicago to the Great Lakes Naval Training Station, which was increased from the original order of 20 round-trip tickets to 235 round-trip tickets in this manner.

Several years ago, Jim Vaughn, a pitcher on the Chicago National League baseball team, was employed by the Nash Motor Works during the winter months. We arranged with the Chicago National League baseball club to have Vaughn pitch on a certain Saturday afternoon in May and by securing the co-operation of the officials of the various manufacturing plants at Kenosha, traffic was created in such volume that it was necessary to utilize 14 cars and one parlor car to convey the party to Chicago and return.

We have been very successful in prevailing upon educators to make trips to various points on the line and during the past six years we have handled several thousand school teachers in chartered car trains. We have successfully tried the experiment on several manufacturers of inviting students of engineering schools to make inspection tours to the large industrial plants at Kenosha and Milwaukee. The original trip called for a two-day schedule. This schedule has now been extended to an entire week and includes the inspection of large plants at Gary, Ind., Buffington and Indiana Harbor, the Chicago railway terminals and Kenosha and Milwaukee plants. These trips are being taken by many large universities throughout the central west and last fall, through correspondence, we sold the idea to universities located 900 miles away from Chicago. The result is that various institutions and universities sent their engineering students over the North Shore Line for an educational trip. We have handled several thousand students and their teachers. We handled 11 universities last fall and expect to increase this to 15 during the fall of 1923.

Some transportation lines merely cultivate the educators shortly before the convention or excursion, whereas this department cultivates these people 12 months in the year. In a number of instances, this department has made hotel reservations, secured choice theatrical seats and made reservations for pullman and parlor cars over steam rail lines.

Our football business has increased greatly in the last few years due to the fact that we get directly in touch with the alumni and students of various schools, members of fraternities, etc., giving them information regarding our service, dining cars, etc., which has produced gratifying results.

To sell transportation successfully, it is absolutely necessary that close co-operation between the operating and the traffic departments be secured. It is impossible for a good traffic salesman to sell transportation unless the operating officers are awake to the fact that to increase earnings it is necessary to render high-class service. This includes operating trains on time with thoroughly clean and ventilated cars, courteous and competent employees and neat appearing conductors and brakemen. Salesmen and ticket agents should be very careful not to misrepresent facts to the public, which is quick to resent mis-information. Selling transportation, in many instances, means selling a man his own mind. In other words, it means making a man want to believe what you want him to believe about your company. Take for instance a prospective passenger. When an agent attempts to sell him a ticket he, the agent, is not selling a piece of pasteboard. The person holding the purchased ticket should have the feeling that his ticket guarantees a safe, comfortable and courteous trip to his destination. He should be made to feel that he has paid for a trip and is a guest of the company for the time that he is on the train. He should be thoroughly "sold." When he gets off the train he should feel appreciative for the transportation that he has received. One satisfied passenger will sell more transportation to his friends in a week than a solicitor can in two weeks.

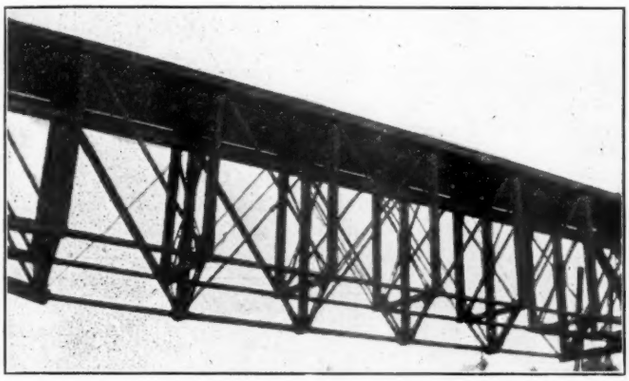
* From a paper read before the Wisconsin Utilities Association at Milwaukee, Wis.

Check Bridge Reinforcement with Strain Gage

Tests After Introduction of Center Truss Show Exceedingly Uniform Stress Distribution

By H. S. Loeffler
Assistant Engineer, Great Northern

ON ACCOUNT OF THE INCREASE in the weight of locomotives during the last quarter century, numerous railways are now confronted with the problem of replacement or reinforcement of many of their light design steel bridges. In cases where the old bridge has been well maintained so that the steel is still in good condition, and where the bridge is of a type that can be easily reinforced, it will usually be more economical to reinforce the old structure



The Center Truss Projects Six Feet Below the Side Trusses

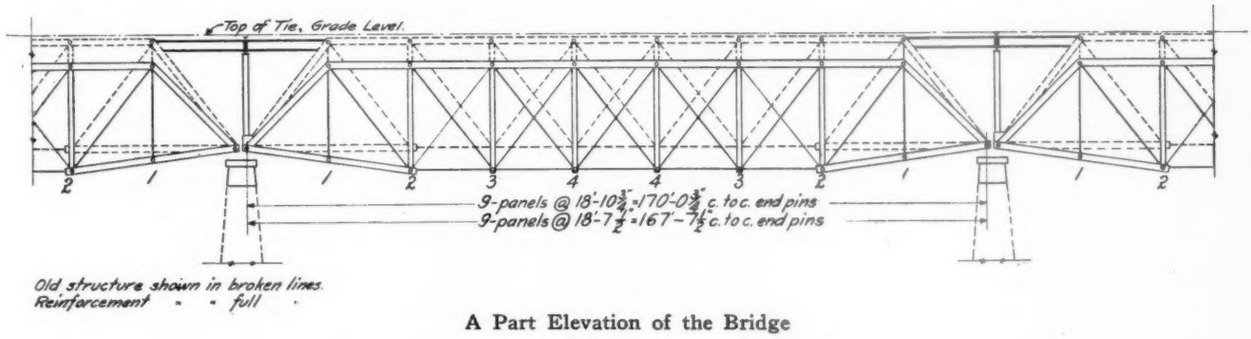
than to replace it with an entirely new structure of heavier design. Thus the Great Northern recently completed the reinforcement of a light design steel bridge in which the strength of the old structure has been doubled, thereby making the bridge serviceable for the heaviest power now used on the system.

The bridge referred to is known as Bridge No. 10, crossing the Mississippi river at St. Cloud, Minn. The old structure consisted of four pin-connected steel truss spans of the deck type, each approximately 170 ft. in length, supported on masonry piers and abutments. These piers and abutments originally carried timber Howe truss spans, which were replaced in 1892 with steel spans designed to carry two 121-ton locomotives, followed by a train load of 3,500 lb. per lin. ft. This loading corresponds approximately to Cooper's E-33.

The principal reinforcement of this structure consisted of the addition of a center truss to each of the four spans. The old trusses were of the pin-connected type, and in the design of the new center trusses pin-connections were also adopted, as it was believed that this would result in a better combination than the addition of a riveted truss. It was desired also to make the depth of the new center trusses the same as that of the old trusses, but on account of the position of the floor beams in the old spans it was necessary to set the new center trusses 6 ft. 3½ in. lower than the old trusses, with the lower chords sloped up in the two end panels to engage end pins at the same level as those in the old trusses. Thus, the new center trusses are of the same dimensions as the old ones except for the length of the end posts and the lower chord end sections ($Lo\text{-}L_2$).

Insure Combined Action

The new center trusses were set with a normal clearance of 1⅝ in. between the tops of the new top chords and the bottoms of the old floor beams, and steel plate shims were provided to fill this space after the new center trusses were swung. Stiffener angles were added on the old floor beams at these points of bearing. New stiff transverse bracing was provided to replace the old transverse bracing which consisted of adjustable rods, this bracing being connected to the vertical posts of the new center trusses. The upper section of the new transverse bracing was made of sufficient strength to carry part of the center floor beam reaction to the old trusses. It was assumed that the three trusses, being connected in this manner, would act in unison; that at any panel point equal deflections would obtain for all three trusses; and hence the unit stresses in similar members of the three trusses of a span would be identical. Strain-gage tests on the completed structure proved this assumption to be correct. The new center trusses were designed to carry Cooper's E-30 loading in addition to their own dead weight. Therefore, the three trusses acting together are capable of carrying Cooper's E-63 loading.



A Part Elevation of the Bridge

The old stringers were replaced with new stringers of heavy design, and the old top lateral system, which consisted of adjustable rods and eye-bars, was replaced with stiff lateral bracing. As the new center trusses did not interfere with the old bottom lateral system, all of this old bracing was left in place. New stiff sway bracing was provided on the end batter posts to replace the old sway bracing which

consisted of adjustable eye-bars. The lower section of the new sway bracing was framed into the end posts of the new center trusses.

Strengthen Piers

Another feature of the reinforcement of this structure consisted of making extensive repairs to the piers and abutments. As the tops of the piers and the bridge seats on the abutments were cracked in several places, it was considered advisable to remove about six feet of masonry from the top of each pier and to rebuild it with reinforced concrete and to remove the bridge seats from the abutments and reconstruct these also with reinforced concrete.

In order to carry out the repairs to the piers and abutments it was necessary to place the entire superstructure on falsework. Pile piers were driven at the second panel point from each end of each span and pile bents were driven on both sides of each pier and at the first panel points of each span. This framework was designed to carry train loads

Member	Engine Number	Train	Observed Stresses		
			Right Truss	Center Truss	Left Truss
SPAN 1					
U_4U_4'	1559	Freight	3200	3570	3750
"	1605	"	3430	3430	3570
L_4L_4'	412	None	2500	2860	2500
"	412	"	2500	2780	2360
U_1L_2	1241	Freight	3280	3000	3430
"	1605	"	3930	3430	4280
"	175	Passenger	2360	2210	2500
U_4U_4'	1231	Freight	3640	3570	3570
U_1L_2	412	"	3570	3430	3930
SPAN 2					
U_4U_4'	1231	Freight	3640	3430	3780
U_2U_3	412	None	2930	2860	3210
U_1L_2	175	Passenger	1790	1860	2070
"	1636	Freight	3780	3430	4280
L_2L_3	—	"	3210	3360	2860
SPAN 3					
U_4U_4'	1605	Freight	3500	3280	3500
U_2U_3	1582	"	3570	2930	3570
$U_2'U_3'$	—	Passenger	2070	1790	2000
U_1L_2	1231	Freight	3430	2860	3210
L_2L_3	175	Passenger	1930	1710	1860
L_4L_4'	412	Freight	3210	3140	3210
$L_2'L_3'$	412	None	2430	2500	2360
$U_1'L_2'$	1503	Freight	3640	3430	3930
SPAN 4					
U_1U_2	175	Passenger	2280	2000	2210
$U_1'U_2'$	175	"	2210	1790	2280
U_1U_2	1636	Freight	4210	3930	3930
$U_1'U_2'$	412	None	2640	2430	2500
$U_1'L_2'$	1403	Freight	3860	4280	4140
$U_2'L_3'$	412	None	2500	2710	2640
$U_3'L_4'$	1219	Freight	3570	3210	3710
$L_2'L_3'$	175	Passenger	1570	1430	1640
$L_3'L_4'$	175	Passenger	2140	2570	2280
L_4L_4'	1571	Freight	3000	2860	3500
U_4L_4'	1241	"	3430	3140	3280
L_3L_4	224	Passenger	2500	2860	2430
L_2L_3	412	None	2290	2780	2500
U_4U_4'	412	"	2280	2280	—
"	224	Passenger	2140	2000	1930
"	412	None	2140	2140	2070
U_0L_0	412	"	1280	1070	—

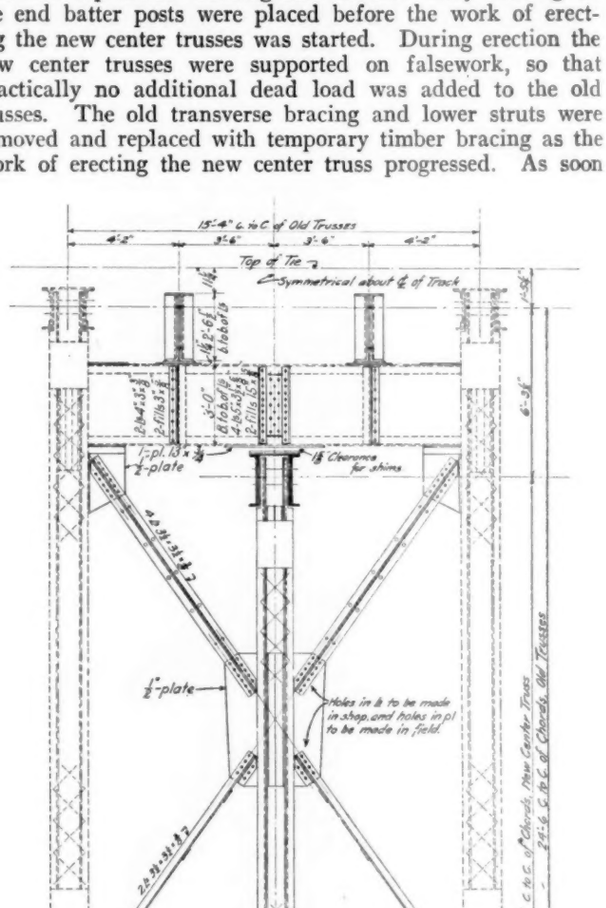
Note: Trains were operating at slow speed in all cases

Table of Stresses Observed with the Strain Gage

as well as the dead weight of the superstructure, as it was necessary to maintain the structure in condition to handle the regular traffic throughout the entire work. All of the falsework was placed by company forces.

How the New Steel Was Introduced

After the repairs to the piers and abutments had been completed the old trusses were swung on their end bearings. The new top lateral bracing and the new sway bracing on the end batter posts were placed before the work of erecting the new center trusses was started. During erection the new center trusses were supported on falsework, so that practically no additional dead load was added to the old trusses. The old transverse bracing and lower struts were removed and replaced with temporary timber bracing as the work of erecting the new center truss progressed. As soon



Typical Cross Section of the Bridge with Reinforcement in Place

as the new center truss in a span was completely assembled it was swung on its end bearings. In the meantime the stiffener angles had been placed at the center of the old floor beams. The steel shims were then placed between the bottoms of the old floor beams and the top chord of the new center truss. These shims were adjusted to a firm bearing with no live load on the span, but were not forced by excessive driving. Then the new transverse bracing was put in to replace the temporary timber bracing. The holes for the connection at one end of all transverse braces were left to be drilled in the field. This not only resulted in a perfect match for the holes but also insured the proper distribution of the dead load between the three trusses. The old stringers were then replaced with new stringers of heavy design, which, with the addition of a new deck, completed the work.

Tests Show Uniform Stresses

After the work of reinforcing the structure had been completed a series of tests were made to determine the distribution of the live load to the three trusses. The live loads for

these tests consisted of the regular traffic over the structure. Strain gages were attached to similar members of the three trusses of a span, and the maximum reading of each instrument during the passage of a train was noted. These tests covered a period of seven days. During that time tests were made on nearly all the main members of the three trusses of one span and on a number of the main members on each of the trusses of the other three spans. In every case it was found that stresses occurring simultaneously in similar members of the three trusses in any span were practically identical.

The reinforcement of the superstructure was carried out under contract by the Guy Willard Company of Spokane, Wash., and under the direction of A. H. Hogeland and J. A. Bohland, chief engineer and bridge engineer respectively, for the Great Northern, St. Paul, Minn. The success attained in completing the above work has afforded an incentive for carrying out additional work of similar character. The Great Northern is now planning to reinforce three more light steel structures this year. Bridge No. 113 at Sandstone, Minn., will require the addition of a center truss to a 160-ft. deck span; bridge No. 140 at Coram, Mont., will require the addition of center trusses to two 215-ft. deck spans and the addition of a line of center girders on new center posts in each approach, and Bridge 122.8 near Minot, N. D., will require the addition of a line of center girders on new center posts throughout the entire length of the structure.

Wood Borers Increase Activity Over Large Area

Progress Report of Marine Piling Survey Contains Valuable Information on Tide Water Structures

"IN WIDELY SEPARATED REGIONS of the world the year has witnessed constantly increasing marine borer activity, and an increasing concern in the problem thus created, on the part of governments and of scientific and engineering bodies." This statement is the keynote of the latest progress report made by the Committee on the San Francisco Marine Piling Survey, in co-operation with the National Research Council, and the American Wood-Preservers' Association. Further facts concerning this serious menace to maritime structures, and the steps being taken to combat it, are outlined as follows, in the introduction to this report:

All these have seemed to confirm the indications of the preceding years that the world is now in one of the major waves of abnormal abundance of marine borers which seem to have occurred at about 50-year intervals since the first great attack of these organisms upon the dykes of Holland in the fifteenth century. The present epidemic occupation of the shores of North America by the destructive *Teredo navalis* of European waters, which was first evidenced in San Francisco bay, has steadily progressed during 1922, it is now causing most apprehension in the general region of New York harbor, where the National Research Council through its committee on Marine Piling Investigations has organized one of its chief campaigns. In that harbor the teredo has during the year become firmly established on both the Long Island and the New Jersey shores above a line across the Battery, and, although as yet less actively, in the harbor structures of lower Manhattan itself. Should the attack there continue to follow the history of that in San Francisco bay, as it so far seems to do and as from the first has seemed probable to the most competently informed members of this committee, the resulting catastrophe will be greater in proportion to the vastly greater total volume and concentration of structures subject to attack and of the interests affected by them. There is therefore the greater reason for active prosecution of all investigations which may reasonably be expected to contribute to the more successful combating of this menace in every practical direction. This committee is glad to believe that its work so far accomplished in both scientific and engineering lines has contributed measurably to that end. This year's contribution is believed to be as important as any that has been presented in previous reports.

Further Conclusions

Efforts of the committee with respect to the protection of timber piling have not given rise to any marked modifications of the conclusions reached in its earlier studies. The committee finds that, as a result of the publicity given to its earlier findings, "gratifying improvement has taken place during the current year" in the methods of handling creosoted piles to prevent damage. With respect to the sheathing of piles with copper, the committee offers favorable report, but calls attention to the fact that the protection thus afforded is easily destroyed by either abrasion or theft.

Insofar as the study of the action of borers on timber and piling is concerned, the work of the committee, as recorded in this report, has been devoted primarily to the discovery of basic scientific facts regarding the exact nature of the borers, particularly the Teredo. One result as developed thus far, relates to the limits of salinity of waters necessary for natural activity of Teredo. On this it says:

"Experimental observations on the activity of *Teredo navalis* in various salinities, as manifested by the extension of the siphons, indicate that the organism is normally active in salinities as low as 9 parts per 1,000, and below this point the activity decreases with decrease in salinity. Below a salinity of 7 parts per 1,000, the proportion of active individuals decreases very rapidly until at 3 parts per 1,000 no teredos are extending their siphons.

"Teredos show remarkable recovery from sudden changes of salinity in aquaria. They have also survived great changes in the salinity of the bay water during the past season."

Another interesting fact is the development of evidence indicating that the Teredo actually derives some nutriment from the wood particles which are swallowed during the process of boring. The results indicate that the wood loses about 80 per cent of its cellulose and 15 to 56 per cent of its hemicelluloses during its passage through the digestive tract of Teredo.

Study Effect of Sea Water on Concrete

One valuable feature of the committee's work as recorded in the report was the study of concrete structures in sea water, leading to the development of specifications for concrete and reinforced concrete designed to secure the greatest resistance to possible destructive action of the water. Conclusions of the committee with respect to the action of sea water on concrete and the possibility of developing a type of construction capable of resisting such action, are also presented, from which the following abstracts are taken:

Proper curing is probably of more importance for air

exposed than for sea water exposed structures. Concrete immersed in sea water cures and sets under ideal conditions. While it is preferable to leave forms in place in order to protect the surface from impacts, no detrimental effects have been observed at San Francisco, either in construction work or in laboratory tests, resulting from early exposure to sea water, and, for facilitating special construction, exposure in 48 hours may be permitted. Precast concrete is often reduced in strength and checked with surface cracks by exposure to the sun and wind, and should be protected against too rapid drying.

Simple concrete structures, whether subjected to protected harbor exposure or ocean exposure, may be relied upon to resist sea water permanently if the concrete is intelligently mixed and deposited in accordance with the provisions of these specifications. The principal abuses to guard against are flooding the mix with excess water and failure to tamp and compact the mass thoroughly in the forms.

Tremie concrete should not be depended upon to resist sea water unless protected by an impervious outer layer of concrete or other material. While concrete is sometimes tremied through small pipes into the restricted openings of composite structures, as in the case of filling of spaces around protected piles, such practice is only justified when the concrete is considered as an inert filler. Tremie concrete can be relied upon for structural loads in simple structures of mass type. The size of the tremie under such circumstances is a function of the depth of water and the size of pocket to be filled. Sizes from 12 in. to 18 in. are recommended, the latter size for depths of 50 ft. and tremie charges of 10 cu. yd.

Protection of Embedded Steel and Wood

The principal cause for the disintegration of composite structures composed of concrete and reinforcing or structural steel is the rusting of the embedded steel under the accelerated corrosive action of the sea water. This rusting takes place above mean tide elevation, in that portion of the structure exposed to both sea water moisture and air. The action is increased by the use of porous concrete and by the formation of fine cracks under impact and tension, which assist the penetration of moisture and air. It is retarded and prevented by the use of dense, impervious concrete and by the sealing of cracks to prevent or retard penetration.

Embedded structural steel may be protected by giving a heavy coat of paint, so that the salt moisture cannot come in contact with the steel, but this decreases the bond. It is possible that a system of painting reinforcing steel which will not seriously reduce the bond may be developed; but with present experience galvanizing is recommended. The protective concrete coating for painted structural steel and timber should be reinforced against impacts with a galvanized wire mesh.

Encased structural steel construction painted with red lead and graphite on the steel and with asphalt on the surface of the concrete should be more durable than reinforcing steel construction. Coatings applied to embedded steel should also serve to inhibit corrosion in case the concrete absorbs sea water salts. Of our medium-priced pigments which are inhibitors, red lead has proved satisfactory for structural steel in sea water exposure. Because it reduces the bond, red lead is not satisfactory for painting reinforcing steel. The question of a satisfactory coating for this purpose is still in the experimental stage and merits the attention and study of engineers.

Composite structures having an ocean exposure deteriorate rapidly above the tide line, even when constructed of high grade concrete. This is probably due to the heavy impacts of waves, which open cracks to the steel, combined with concentration of sea salts from repeated drenchings with sea spray.

Asphalt coatings as described previously for harbor exposures will undoubtedly be beneficial in prolonging the life of these structures; but owing to the severity of wave wash and the cutting action of sand, it is believed that more resistant coatings are justified. Steel shell protection from low water to the deck line is suggested as a feasible protection for this exposure.

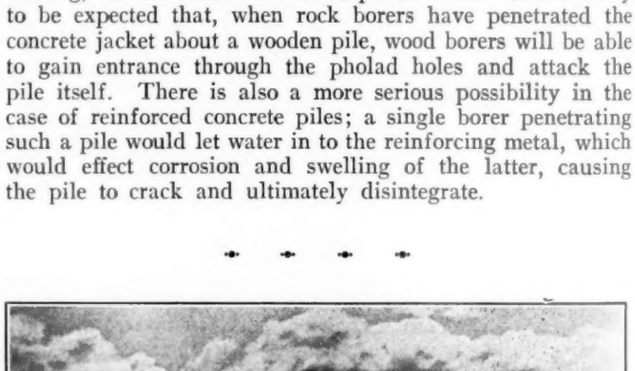
Concrete Borers

The discovery of some concrete work in Los Angeles harbor in the form of jackets over wooden piles in which the concrete was found to be infested with pholad borers, has excited considerable attention, and the report of an investigation of this condition comprises an interesting feature of the committee's report. This borer was found to be the *Pholadidea Penita,* or what is commonly known as the rock clam. Investigation disclosed that the concrete in which this clam had been at work, was of a rather poor quality. Comments by the committee on this phase of the problem, together with excerpts from the committee's conclusion, are as follows:

These jackets were in general of cement mortar poured around the piles by setting forms after the piles were driven. Some of the jackets had given service in sea water over a period of fourteen years. The hardness of the mortar was such that a sample of the best mortar in which the borers were found could be readily cut with the thumb nail.

The probability of attack on well made concrete piles and high grade concrete structures hinges on whether the action of the borers is mechanical or chemical, which problem is now under investigation. If the action be mechanical, hard, sound mortar will probably serve only to retard boring action. In either case the use of a well graded aggregate of hard rock may be expected to limit, if not prevent, borer action by confining it to the interstices filled with mortar.

The findings set forth above are, to say the least, disturbing, and indicative of serious possibilities. It is entirely to be expected that, when rock borers have penetrated the concrete jacket about a wooden pile, wood borers will be able to gain entrance through the pholad holes and attack the pile itself. There is also a more serious possibility in the case of reinforced concrete piles; a single borer penetrating such a pile would let water in to the reinforcing metal, which would effect corrosion and swelling of the latter, causing the pile to crack and ultimately disintegrate.



Published by Courtesy of the Railway and Locomotive Historical Society.

B. & M. Locomotive "Saxon" Equipped with Magoon Feedwater Heater Operated from Crosshead. Used Between Boston and Exeter About 1874

Further Proceedings of Air Brake Convention

Denver Meeting Discusses Part of Members in Roads' Program to Provide Adequate Transportation

FOLLOWING the opening program of its thirtieth annual convention on May 1, the Air Brake Association completed the consideration of a full program on May 3. The following papers were read and discussed:

Expediting Train Movement, by the North-West Air Brake Club; Charging Freight Trains and the Use of Release Position, by W. F. Peck (Baltimore & Ohio); Causes for Slow Operation of Locomotive Air Compressors, by the Pittsburgh Air Brake Club; Feed Valve Tests, by the Manhattan Air Brake Club, and two papers on the 8½-in. cross compound compressor, one by the Central Air Brake Club and one by the Dixie Air Brake Club. George H. Wood (Atchison, Topeka & Santa Fe), in a brief talk also discussed the relation of train control to the air brake. Abstracts of some of these papers and the discussions following them are given below.

Expediting Train Movement

By The North-West Air Brake Club

The following is an abstract of a paper presented for the North-West Air Brake Club, by H. G. Clark (M., St. Paul & S. S. M.):

In his address before this convention W. R. Scott, president of the Southern Pacific Lines, called attention to the impending transportation crisis and stated that among other measures to meet the situation, it is proposed to reduce the bad order cars from the present 9 per cent to 5 per cent, the freight locomotives awaiting heavy repairs from about 21 per cent to 15 per cent, and to increase the car mileage to 30 per day. That strenuous efforts in 1920 were able to raise the car mileage to only about 25 per day, and that the car loading is expected to exceed by from 7 to 15 per cent the peak of 1920, will indicate the task before us.

In his efforts toward maintenance, the air brake man must not lose sight of the fact that the air brakes are merely one important means toward the end of moving traffic. A train or even a car held for brake testing or repairing only, where such work could in part or in whole have been done during a necessary delay for some other work is an inexcusable interference with traffic movement. To the extent that the air brake man keeps this in mind, informs himself of the operating department's plans for expeditious freight train movement and submits plans for testing and repairing that will utilize dead time to the best advantage and cut necessary delays for such work to the minimum, will he realize his opportunities.

But the inauguration of good plans will accomplish little. They must be followed up patiently and persistently. There must also be a general co-operation by all railways, not leaving the burden largely to those with steep grades, as has been done too generally. A chain is no stronger than its weakest link; if mountain roads must make the heaviest repairs the traffic of the entire country will be materially slowed and endangered.

The thing to strive for is to have the air brakes in such condition when the outgoing engine is coupled to the train that all that will be required is a formal test to insure that the brake condition is as intended, followed by an immediate release.

As no one can argue against the desirability of this and as it cannot be even remotely approached if the outgoing test is awaited to disclose any defective brakes, it is plain that without the incoming brake test no worth-while effort has been made to meet the great needs of the times.

It is not enough merely to get an order issued that the incoming test shall be made. Some of the first difficulties such an order runs into are:

(a) A delay because the engineman felt it necessary to recharge before applying for the test. This tends toward an incomplete recharge and a poor test.

(b) The brakeman closes the angle cock on the tender before the test application is completed, thus destroying the test except by a delay to thoroughly recharge and then apply.

(c) If the train is to be put on two tracks, it is felt that the test application cannot be made. This is not so.

(d) A switchman opens an angle cock soon after the test application is made, thus increasing the rate of brake cylinder leakage and spoiling the test.

(e) If the incoming crew see no car men present they decide that no test application is necessary. The test application should be made invariably.

(f) Uninstructed switchmen bleed off good brakes before they are inspected, thus causing such brakes to be bad ordered.

(g) The air brake inspection is combined with the general inspection, thus taking so much time to complete that effective brakes are condemned for leaking off. The air brake inspection should be completed within 20 minutes after the test application is made.

(h) The engineman fails to insure a full 20-lb. service reduction for the test, often making no more than was required for the stop, instead of adding to this enough to make the total reduction a full 20 lbs.

If full advantage of necessary delays is to be taken to do air brake work, then all cars on repair tracks must have their brakes so tested as to disclose their actual condition, all must be repaired that are not efficient, irrespective of stencil dates, and all must be cleaned where the stencil date is nine months old or more. Full advantage also must be taken to inspect the repair brakes, as well as other practicable parts, on cars "parked" at transfer and freight sheds, and team tracks where the number per day will justify. Motor driven compressors requiring no care other than occasional inspection and oiling, and pipes laid on the ground will often permit of quickly preparing to do such work. At what time is it more important to have a freight car ready to proceed than right after it is loaded? And when is there a better time to prepare a car for being loaded than when it is being emptied?

Monthly brake cleaning reports, identifying the cars and the previous cleaning stencils, with all cases where the brakes were found ineffective within four months after cleaning tabulated by home road cleaning points, will make it possible to stop inefficient cleaning.

To have high ideals to strive for is well worth while, but to insist that ideals be attained when existing conditions are far from ideal will obtain far less results than to stipulate merely a moderate improvement. In fact, emergencies occasionally justify practices deviating from the standard. More brakes can be cared for if the brake cylinder pistons are cleaned under the car and replaced than if taken to a room. To say that the work cannot be done efficiently under

the car is to ignore that many roads with the best average brake maintenance do this.

Referring to such an emergency as evidently impends, and with the distinct understanding that this suggestion does not apply otherwise, if at some transfer or freight sheds where many cars are available per day it is impossible to get an air supply, at least for some time, why not locate and indicate the ineffective brakes by an incoming test just before the cars go to such points, and then clean the brake cylinders and replace the triple valves with others that have been cleaned and passed over the test rack? This will not only effect a big improvement with no car delay, but if well instructed and reliable men are assigned to the work it is confidently believed that the results will well justify the temporary deviation from correct practice until compressed air can be supplied.

Even if you have a train yard test plant why not have the test application made on the incoming trains by the enginemen and save time for the train and the car men instead of coupling to the yard plant, charging and applying the brakes? The need for having the inspectors present when the trains stop will reduce the dead time for trains.

Furthermore, it is easily possible by casual and quick inspection, a twist on each angle cock and retaining valve pipe (the latter while changing the triple valve or by vibrating it when no change is necessary) and by a pull with a wrench on any unions, to very materially reduce pipe leakage without any air pressure for testing. On one mountain grade subject to interchange traffic, unsatisfactory retaining valve efficiency was very materially improved by having the train inspectors at the previous terminal shake each retaining valve pipe and tighten joints that this disclosed to be loose.

Other possible and valuable improvements with no air for testing are turning angle cocks and hose to proper position, tightening loose brake cylinders, auxiliary reservoirs and pipes, locating and replacing missing cotters, replacing worn-out brake shoes, etc., as well as repairing defects of other than the brake parts.

The will to do all that we can and earnestly looking for them will disclose remarkable opportunities for improvement without car or train delays, often with no more men, and, in many particulars, even without air for testing.

Discussion

The discussion of this paper dealt very largely with the advantages of the incoming brake test and the difficulties generally encountered in making it effective. Some of the members advocated the release of the brakes after the train had been brought to a full stop in the yard in order that the slack might be stretched before making the 20-lb. test reduction. This, however, was not generally favored by the members who took part in the discussion because of the additional time required and, therefore, the greater difficulty of getting the co-operation of the incoming crews and the yardmaster to make the test effective. It was suggested by several of the members that yardmasters are responsible for the greatest opposition to the effective performance of the incoming test because of their hurry to break up the train. Some of this objection can be overcome by permitting them to close the angle cock between cuts of five to ten cars behind the inspector, so that the brakes on the cars already inspected can be bled off.

There was no dissent in the discussion to the opinion that the incoming brake test is a most effective means of reducing terminal delays and effecting promptness in the dispatching of trains through the utilization of terminal time for the making of air brake repairs rather than trying to do the work after the train is made up and ready to depart from the yard. The extent to which the test is effective depends on the determination of the responsible officers to make it effective, and not on any inherent conditions imposed by the test.

Charging Freight Trains and Use of Release Position

By W. F. Peck
Baltimore & Ohio

A recent analysis of the factors surrounding an epidemic of stuck brakes on freight trains revealed the fact that insofar as operation is concerned, there was a considerable variance in the method used by enginemen in charging empty trains, and releasing brakes after slow-downs and stops, also, that trains were departing from water stations or other points where the engine was detached without waiting until all brakes had released. Where stops were made, whether the engine was detached from the train or not, it was the practice for the engineman to start on receiving a proceed signal from the train crew. The flagman, on being recalled to the train, might believe the brake on the last car had had time to release properly, while in fact it had leaked off, and brakes nearer the engine were still applied.

The purpose of the investigations forming the basis of this article, was to determine accurate data on: First, the quickest method of uniformly charging the empty or the partially charged brake system of freight trains of from 35 to 100 cars, to make the brakes available for use in the shortest possible time; second, the most effective method of releasing the brakes after ordinary service applications; third, the most effective method of releasing the brakes and recharging the system on the return of the engine to the train after having taken coal or water, and fourth, to establish certain fundamentals in regard to manipulation, which would automatically result in the best operation and increase the factor of train safety.

Numerous tests have been made to determine resultant cylinder pressures, and also the time required to apply the brakes with various reductions and types of triple valves. This information is available in the log sheet of every important demonstration; yet, similar data in regard to charging trains and releasing brakes does not appear available. The value of such information is emphasized where schedules are fast and trains frequent, since any attempt on the part of the engineman to depart before the brakes have had time to release may result in a break-in-two, or a burst wheel, due to over-heating. The demonstrations were made with these conditions in view.

The tests numbering 271, were made on the 100-car test rack of the New York Air Brake Company, at Watertown, N. Y., with trains of 35, 50, 75 and 100 cars.

Conclusions

Certain definite conclusions may be drawn from the results of these investigations, without going into detail.

First—Attempting to charge the train by comparatively short movements of the automatic brake valve handle from release to running position and back, will only result in the pressure banking up and overcharging the head end of train. The longer the train, the more serious the results will be.

Second—Long trains are neither charged nor brakes released *primarily* with the automatic brake valve in full release position (standard locomotive brake equipment), since the time which it is possible to stay in full release position is short when compared to the total time required to charge or release all brakes.

Third—Any system of releasing brakes, which results in brakes reapplying, due to overcharging the head end of train, is not considered practicable, because it is impossible to designate a uniform kick-off, which will release all of these brakes without liability of other brakes reapplying, as a result of the kick-off. Any overcharging of the head end of the train necessarily prevents the prompt functioning of the

feed valve. In both charging and releasing brakes, it is absolutely necessary that there be no interruption to the flow of air into the brake pipe. Brakes which re-apply simply rob the system of compressed air, which must be replaced before charging or the release of the brakes is completed. When the use of full release position was carried to an extreme, it was observed that one-second kick-offs were of no avail, and that five seconds was too long.

Fourth—It is highly important that feed valves be maintained at their maximum efficiency, since there will be an interruption to the flow of air into the brake pipe if they do not function properly.

Fifth—In releasing brakes, trains of less than 60 cars should not depart before three minutes after the brake valve has first been placed in full release position; longer trains four minutes.

Sixth—Since one 8½-in. 120-ft. air compressor is practically equivalent to two 11-in. air compressors, the manipulation which is found good in one case must therefore be equally satisfactory in the other.

Seventh—Because the auxiliary reservoirs of 35-car trains charge so uniformly, it is possible and entirely practicable, to have a standard method of charging empty trains of from 35 to 100 cars, also releasing brakes after applications, with the exception described hereinafter.

Eighth—The quickest method of charging the system as uniformly as possible is to place the handle of automatic brake valve in full release position for one minute, move it to running position for two minutes and follow up with a five-second kick-off, and then leave in running position thereafter. There is no particular reason for the brake valve handle being left in running position two minutes except to draw attention of the engineman to the importance of uniformly charging the train through the feed valve. This provides ample time for the pressure in the brake pipe to equalize. This operation should be timed with his watch.

Ninth—The best results will be secured in releasing brakes on trains of from 35 to 100 cars after service reductions ranging from 10 to 40 lbs., by the following manipulation: Place the handle of the automatic brake valve in full release position for 15 seconds, move to running position for 30 seconds, and then make a three-second kick-off to full release position. An exception to this is made when making 10-lb. reductions on trains of less than 60 cars. In such cases, the brake valve handle should be left in full release position 10 seconds initially, instead of 15 seconds. Reductions of more than 20 lbs. were intended to represent cases where the engine is cut off from the train for coal or water.

Discussion

In presenting the paper, Mr. Peck stated that the tests were made with a view to developing the proper charging of trains and use of the release position of the engineer's brake valve on level road and not on mountain grades. He explained that on the Baltimore & Ohio it was not on the heavy grades that the trouble from overheating wheels was encountered, but on level districts. The discussion, however, dealt largely with braking on heavy grades. A number of the members emphasized the importance, in grade work, of restoring brake pipe pressure in the shortest possible time and did not regard with favor any instructions as to the details of brake valve manipulation, since safety depended so largely on the ability of the engineman to exercise his judgment according to circumstances.

P. H. Langan (D. L. & W.) said that an investigation several years ago as the result of many break-in-two's in handling 100-car empty trains, developed the fact that the enginemen were holding the release position for about 12 seconds, going to the running position, then to the release position for the kick-off and back to the running position in a total time less than that required for the run-in of the slack to take place. The adoption of a 30-second release stopped the break-in-two's. After water stops, Mr. Langan advocated holding the brake valve in release position from three to four minutes, then going to running position, followed by a 15-lb. reduction before the kick-off.

In handling trains on grades, Mr. Langan expressed the opinion that safety required the longer period in the charging position, while on the level its use was justified because of the saving in time. He advocated requiring the trainmen to bleed off any sticking brakes which might result, as the train moved passed them. Mr. Langan explained that on the D. L. & W. a release after a full application of the brakes was not permitted on freight trains until the train had stopped. Mr. Peck said that on the Baltimore & Ohio the enginemen were permitted to release the brakes at speeds of about 15 miles an hour or above, which would not permit brakes which stuck following the release and recharging, to be bled off by the trainmen. It was suggested that permitting trainmen to bleed off brakes might result in continuing triple valves in service which ought to be removed for cleaning and repairs. It was also suggested that some means be developed for automatically controlling the use of full release position of the brake valve.

George H. Wood (A. T. & S. F.) described the result of a test in which the recharging of a 100-car train with one and two feed valves was compared. Following a reduction of five pounds from 60-lb. brake pipe pressure, the pressure was restored through the feed valves until it reached 64 lb. on the first car and 50 lb. on the last car of the train. With two feed valves this required 11 min. 2 sec., while with one feed valve it required 11 min. 58 sec. W. H. Clegg (Canadian National), said that the use of two feed valves had been found undesirable because it took the control of the train away from the engineman when the brake valve was in lap position, because the two feed valves permitted the operation of the brake with so much larger rates of leaking.

Train Control and the Air Brake

By Geo. H. Wood
A. T. & S. F.

In a brief talk on the relationship between the air brake and train control, George H. Wood (A. T. & S. F.) stated that the air brake is the foundation of a train control system on which the rest of the system must be built up. In applying train control he said, certain conditions such as the maximum permissible speeds at which both passenger and freight trains are to operate, and the safe stopping distances, must be determined in advance. For freight trains speeds as high as 50 miles an hour can be maintained under certain conditions and to stop these trains at this speed with a full service application, would require a distance of from 7,000 to 8,000 ft. On a double track, then, this distance from the point at which the track was occupied would be sufficient for the first application of the brakes. On single track, however, it would be necessary to get applications on trains approaching each other when they were 15,000 ft. apart. But over such great distances it is difficult to maintain satisfactorily electrical conditions. Again, Mr. Wood pointed out, if say 7,500 ft. is required to stop a train of 80 cars at the assumed maximum speed on the level, it would be necessary to add 1,000 ft. on a 1 per cent grade. Furthermore, with brakes anything less than 100 per cent efficient, a greater distance would be required and, therefore, a brake condition tolerance must be established and allowed for. This, he said, should provide a good margin.

In discussing the relation of train control to the manipulation of the brakes, Mr. Wood defined the maximum range

in the character of the stop as being between the rough, emergency stop at one extreme and the smooth drift stop, without the use of brakes, at the other. Within this range, he pointed out, the development of the air brake had been working toward a practically smooth stop on long trains, and he said that if the same conditions as to smoothness of stop and freedom from damage required from the brakes when manipulated by the engineman are to be required from the train control system, then the system must provide for a manipulation like that performed by the engineman.

Any train control system, Mr. Wood said, which tended to remove all responsibility for the operation of the brakes from the engineman, would create a dangerous situation. Under such conditions both the engineman and the trainman are liable to grow lax in their attention to the condition of the brakes with the result that at some critical moment, because of a closed angle cock, excessive brake pipe leakage or other similar conditions, the brake may not be effective. With any system, he said, it is of paramount importance that the men be impressed with the fact that the brakes must be right, as without them the train control apparatus is of no avail.

Mr. Wood said that the train control system to be installed on the Atchison, Topeka & Santa Fe provides for three control speeds, the maximum of which is 75 miles an hour for passenger and 50 miles an hour for freight trains, and that the brake is applied in the same manner employed by the engineman. The Santa Fe is setting up a distance of 8,000 ft. for caution indications, with a distance of 12,000 ft. for two trains approaching each other.

The association adopted a motion calling for the appointment of a train control committee to study the subject in its relation to the air brake and report at the next convention.

Closing Business

The following officers were elected for the next year: President, George H. Wood, A. T. & S. F.; first vice-president, C. M. Kidd, N. & W.; second vice-president, R. D. Burns, Penna.; third vice-president, M. S. Belk, Sou. The following are the members of the Executive Committee: H. L. Sandhas, C. R. R. of N. J.; H. A. Clark, M. St. P. & S. S. M.; W. W. White, M. C.; J. J. Flynn, D. & H., and William H. Clegg, C. N.

Crane Manufacturers Adopt Performance Standards

WHAT IS BELIEVED to be distinctly a step for the better in crane construction has been taken by several members of the Locomotive Crane Manufacturer's Association in the adoption of standard specifications governing the capacities and performances of this equipment. These specifications apply specifically to all standard type of locomotive cranes for standard gage track, the dimensions of which do not exceed the railroad clearance height of 16 ft. and form the basis upon which the capacities of all other locomotive cranes are rated. These specifications will have the effect of removing much of the confusion concerning the capacity ratings of different machines. Thus, any crane manufactured under these specifications which is rated at 15 tons will be a machine capable of lifting at least 30,000 lb. at a 12-ft. radius when equipped with a 40-ft. boom and not using an outrigger, and at least 6,000 lb. with the boom at the 40-ft. radius, operated under similar conditions. At the same time it will be known that the machine will lift at least 17 per cent greater weight than the safe load specified, before tipping. The specifications will also eliminate confusion with respect to the radii and length of boom of different cranes, the conditions under which the ratings are made, including that of the stability against tipping backward when the crane is at right angles to the track, and with respect to the determination of tractive effort in all cranes built to travel under their own power. The locomotive type of crane mounted on tractor treads will, of course, be capable of lifting greater loads, depending on the increased distance between the center of gravity of the crane and the tread over the distance between the center of gravity and the rail in the case of the cranes mounted on trucks, but the basis of the rating will be the same.

The manufacturers which have adopted these specifications include: The Browning Company, Cleveland, Ohio; the Brown Hoisting Machinery Company, Cleveland, Ohio; the Industrial Works, Bay City, Mich.; the Link Belt Company, Chicago; the McMyler-Interstate Company, Cleveland, Ohio; the Ohio Locomotive Crane Company, Bucyrus, Ohio, and the Orton & Steinbrenner Company, Chicago. The specifications adopted are as follows:

Performance Standards of the Locomotive Cranes

1. These performance standards apply only to standard types of standard gage cranes, not exceeding railroad clearance height of approximately 16 ft. Locomotive cranes of nominal rated capacities other than those stated in paragraph 2 must conform to the basis established by those standards.

2. Locomotive cranes of nominal rated capacities shown below must have at least the capacities listed as the minimum in the following table:—

Nominal rated capacity	Car	Minimum safe load without outriggers: 12-ft. radius	40-ft. radius
10-ton	4-wheel and 8-wheel	20,000 lb.	4,000 lb.
15-ton	4-wheel and 8-wheel	30,000 lb.	6,000 lb.
20-ton	8-wheel	40,000 lb.	8,000 lb.
25-ton	8-wheel	50,000 lb.	10,000 lb.
30-ton	8-wheel	60,000 lb.	12,000 lb.

NOTE—The minimum safe loads shown above are based upon using a 40-ft. boom, but are not necessarily available with booms of greater length.

3. The tipping capacity of a crane is at least 17 per cent greater than the safe load specified at any and all radii.

4. The tipping fulcrum is taken at 2.45 ft. from the center of the crane.

5. The radius is the distance from the rotating center of the crane to the center of gravity of the suspended load.

6. In order to eliminate the varying effect of centrifugal force in a rotating test of a crane with the maximum load at any radius, the radius thus determined is to be fixed by tying the load back to the boom foot.

7. The lifting capacities of a steam crane are computed with fuel and water tanks half full, and with two gages of water in the boiler.

8. The fall block is considered part of the crane only when required to lift the load. The intention is to rate a crane satisfactorily for bucket work, in which the bucket usually operates on a single line.

9. In figuring the stability to the rear, the center of gravity is taken a distance of 21 in. back of the center of the crane, with half the specified capacity of fuel and water in the tanks and two gages of water in the boiler on steam cranes, with the boom at the minimum radius for the length of boom used and with the fall block on the ground.

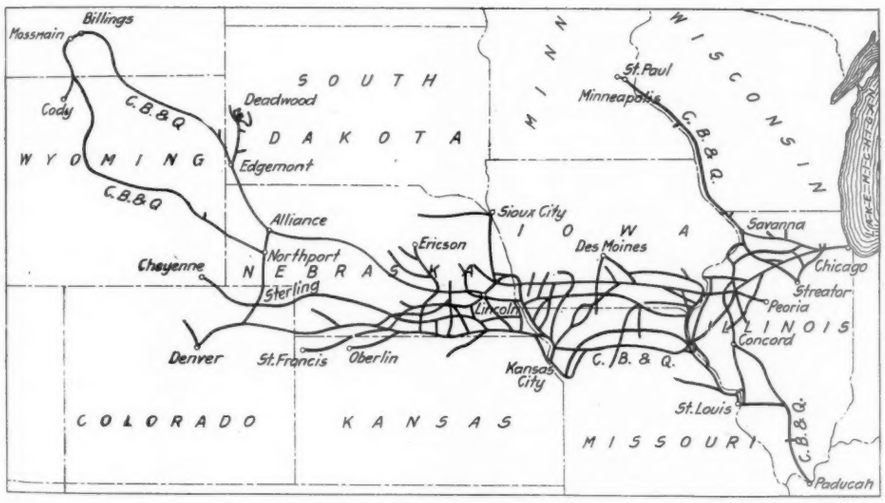
10. The length of the boom is measured from the center of the hinge pin to the center of main hoist sheave pin.

11. The tractive effort, draw bar pull, or grade specified must be considered definitely in connection with the travel speed at which that tractive effort or draw bar pull is available and the grade specified negotiable. The tractive effort utilized in the specifications of these functions does not exceed 17 per cent of the weight on the propelling axles, with one-half fuel and water in the tanks and two gages of water in the boiler on steam cranes, and without load.

Rate Reductions and Strikes Cut C. B. & Q. Net

Results Not as Good as in 1921—Large Program of Physical Improvement Under Way

IT IS INTERESTING to observe the manner in which the Chicago, Burlington & Quincy continues to secure a somewhat unusual amount of attention among those interested in one way or another in railway affairs. Its activities were given considerable prominence two years ago at the time of the refunding of the Northern Pacific-Great Northern joint 4 per cent bond issue and when the publicity attendant upon the issue of its $60,000,000 or 54 per cent stock dividend attracted attention to the substantial earning power of the property. Later its extra dividends attracted further attention and much was made of the fact that it was these extra dividends which in part, at least, enabled the parent companies—the Great Northern and Northern Pacific—to maintain their 7 per cent dividend rates at that time. A new element which has worked out to maintain the interest in Burlington activities was offered recently in the form of the plan presented by Hale Holden, president of the Burlington, for a consolidation into four railway systems of the carriers west of the Mississippi river. Some criticism has been made that the railways have not showed a more practical interest than they have in consolidation plans. This is not a criticism which can be brought against the Northern Pacific, the Great Northern and the Burlington, because they have lately been playing a leading role in the discussion of this important problem. These three carriers have offered the suggestion that they should be consolidated to form a single system. In all the discussion which has arisen around this far-reaching proposal, probably the element of outstanding importance has been the establishment of a realization of the importance which the Burlington would play in a system of this sort. It would not be correct to regard the Burlington as the nucleus of the consolidation along the lines suggested by the managements of these three properties, but there is no question that the Burlington would occupy a position very much in that order.



The Chicago, Burlington & Quincy

The fortunes of the roads in the Northwest have not been of the best since the period of federal control. These carriers seem to have been slow in getting back to a standard return basis of earnings and the result is shown in no better way than by the reduction from 7 to 5 per cent which the Great Northern and Northern Pacific have recently been required to make in their dividend rates. The Burlington seems to have been in a somewhat more fortunate position. Whether this may be due to its much greater tonnage of coal or to one or the other of a number of conditions, might be a question, but the fact remains that the Burlington has continued to give increased evidence of its favorable position and of its earning power.

A Study in Contrasts

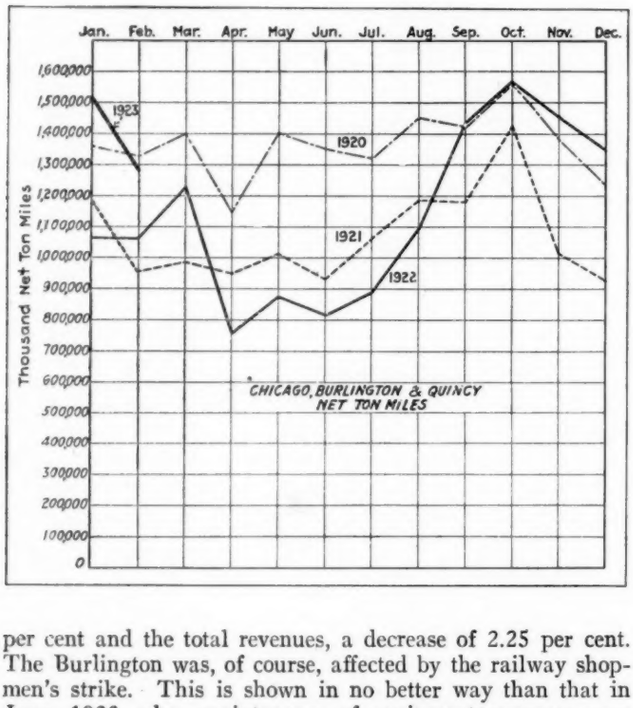
The year 1922 was far from being a typical one for the Burlington. Its operations during the year were much in the nature of a study in contrasts. This is a statement which has previously been made in these pages concerning the operations of the roads serving the non-union coal districts. The fact that in both instances there was a study in contrasts is, however, as far as the similarity goes, because beyond that, in the case of the Burlington and in that of the non-union coal carrying roads, the conditions were exactly reversed. The roads serving the non-union coal areas of West Virginia, Kentucky, Tennessee, etc., had an unusual expansion of tonnage and earnings in the early months of the year and notably after April 1, when the strike in the union coal fields began, and the call was made upon the non-union coal areas to help in filling in the decreased fuel supply. This expansion continued up to July 1, when railway operations were impeded by the railway shopmen's strike. The Burlington serves union coal fields. Normally some 34 per cent of its total revenue tonnage is coal. Whereas the carriers serving the non-union coal fields had good months in the early part of the year and less favorable conditions in the latter part, the situation on the Burlington was the opposite. The absence of the coal traffic during the duration of the coal strike kept Burlington traffic at a low level so that during the five months, April to August, the ton-miles were much below those for the corresponding months of 1921 and for the first four of the five, not much above one-half the traffic for the corresponding months of 1920. In the latter part of the year, however, the Burlington was called upon to carry a peak load. Its traffic in the latter four months of the year was well in excess of that for the corresponding months of 1920, and the peak of October, 1920, was exceeded in October, 1922.

The three elements which most affected railway operations in 1922 were, as has been previously pointed out in these pages, the coal strike, shopmen's strike and reductions in railway rates. The effects of the coal strike on the Burlington tonnage has already been mentioned. It might be added, however, that although the traffic in coal was at a minimum for the five months' period, the coal tonnage handled during the year was only slightly less than that handled in 1921. It was very much less, however, than the coal traffic in 1920. The actual figures are as follows: 1922, 10,857,605 revenue

tons or 27.71 per cent of the road's total tonnage; 1921, 11,991,724, or 33.2 per cent; in 1920, 16,334,711, or 34.59 per cent. The coal strike also affected the Burlington to the extent that the management had to seek its fuel supply from distant sources with the result that the cost per ton was considerably increased, notably with respect to the freight charges.

Reduction in Ton-Mile Earnings

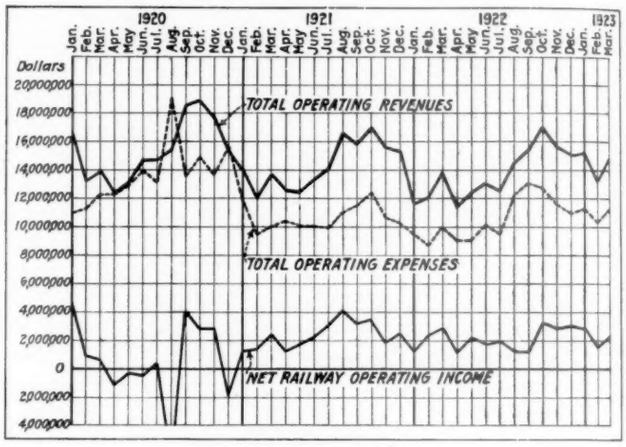
Products of agriculture in 1922 constituted 23.39 per cent of the Burlington's total revenue tonnage. The Burlington is one of the largest carriers if not the largest carrier of live stock, products of animals in 1922 constituting 7.30 per cent of the total tonnage. Further than that, the largest part of the products of agriculture it carries is in the low grade commodities, as is shown by reference to the fact that of the total tonnage in 1922, 6.65 per cent was wheat; 6.56 per cent was corn, and 1.48 per cent was oats. These facts are introduced in this detail because the reductions in rates in 1922 were greatest on products of agriculture and the reductions in these commodities were made on January 1, whereas on other commodities the effective date was July 1. The decreases effective January 1 amounted to 13 per cent in the rates on wheat, 21 per cent on corn and other coarse grains, 10 per cent on live stock and 10 per cent on hay, fruits and vegetables. The effect on Burlington earnings was a reduction in its earnings per ton per mile, from 1.163 cents in 1921 to 1.033 cents in 1922. The road's revenue ton-miles in 1922 were, even with the coal strike, 11.37 per cent in excess of those of 1921. As a matter of fact, however, the total freight revenues showed a decrease of 1.08



per cent and the total revenues, a decrease of 2.25 per cent. The Burlington was, of course, affected by the railway shopmen's strike. This is shown in no better way than that in June, 1922, when maintenance of equipment expenses were $2,781,705, whereas in July the charge was only $1,891,052, indicating that the shops were to a considerable extent idle and that the usual amount of work was not being done. Further, in August the charges were $3,074,612; in September, $3,788,267, indicating either increased costs or the making up of work deferred during the more acute part of the strike period. That the strike was not an unduly severe factor in the Burlington operations, however is indicated by the sharp expansion in traffic which the road was able to make in the latter part of the year. The Burlington is generally understood to have been unusually successful in overcoming the effects of the shop walkout.

1922 Results

Two points have been made in the foregoing; namely, that 1922 was, for the Burlington, a study in contrasts and that it was not a typical year. The final result of the year's operations was a net railway operating income of $25,152,174 as compared with a figure for 1921 of $29,145,007. The combination of conditions experienced in 1922 again kept the Burlington from restoring its operations to a pre-war basis. The property had a standard return based on the average of the net operating income for the three years ended June 30, 1917, of $33,390,080, which figure the Burlington has not yet succeeded in approaching in any year since the beginning of federal control. The 1921 net was the closest



Revenues and Expenses

approach which it has thus far made. The corporate net after fixed charges in 1922 was $20,261,488 as compared with $25,609,973 in 1921. The dividends, now at the rate of 10 per cent on $170,837,000, amount to $17,083,700. The dividends from income in 1921 included part of the extra disbursements made during that year and totaled $19,300,382. The income balance transferred to profit and loss in 1922 was $2,883,537 as compared with $6,014,948 in 1921. These details seem to point out that if with the unusual conditions of 1922 the Burlington could earn its 10 per cent regular dividends on its increased capital with a margin to spare of nearly $3,000,000, it should have no trouble in maintaining this rate in the future. It is naturally to be expected with the improvement in business conditions that the Burlington should soon be back on its standard return basis.

The total tons handled by the Burlington in 1922 were 39,176,051 as compared with 36,116,089 in 1921 and with 47,233,256 in 1920. The increase in revenue tons in 1922 as compared with 1921 was 8.47 per cent and in tons one mile, 11.37 per cent. The freight revenues totaled $121,388,902 as compared with $122,716,630 in 1921. The total operating revenues of $164,916,471 compared with $168,712,268 in 1921 or with $186,872,918 in 1920. There was a reduction in 1922 as compared with 1921 of 2.25 per cent. Operating expenses in 1922 totaled $126,777,703. This figure compared with $128,216,290 in 1921 and represented a decrease of $1,438,587 or 1.12 per cent. The operating ratio was 76.87 as compared with 76 in 1921 and 88.52 in 1920. President Holden, in his annual report, explains that a larger reduction in the operating expenses might have been expected in 1922 had it not been for the increased cost of coal and the extraordinary expenses in connection with the shopmen's strike.

Improvement in Physical Plant

In 1922 the Burlington expended $19,371,342 chargeable to capital account, which would seem to be a rather large amount, particularly under the adverse conditions. The Burlington is noted as being one of the leaders among the country's railroads in the manner of expanding and improving its physical plant. The annual report contains the usual imposing list of improvements of this character. Among the leading projects noted is the work on the Chicago union station in which the Burlington has a part interest, the construction of a new inbound freight house at Harrison street, Chicago, now about completed and on which there was spent in 1922 over $700,000, the grade elevation project in Aurora, Ill., completed last November and on which in 1922 over $1,000,000 was spent, a new large locomotive repair shop at Denver, begun in 1922 estimated to cost over $2,300,000, a 900,000,000-gallon reservoir at Galesburg, Ill., as well as various double track work, new signals, etc. The road received during 1922 nearly 100 new passenger cars, 7,200 new freight cars, 40 new locomotives and 60 additional freight locomotives were ordered for delivery in 1923. This new equipment should assist the Burlington markedly in handling the increased traffic which it may expect in 1923. On April 1 the road had 8.1 per cent of its freight cars unserviceable and its per cent of locomotives held for repairs requiring over 24 hours totaled 18 per cent. These figures are slightly above the averages which the A. R. A. program sets for October 1.

"Progressives" Call Valuation Conference

WASHINGTON, D. C.

THE ANNOUNCEMENT by Senator La Follette, as chairman of the committee on transportation of the "progressive" group in Congress, of a call for a national conference on railroad valuation to be held in Chicago on May 25 and 26, may indicate a reflection of the opinion that is rapidly gaining ground among observers of political conditions that the prospects for railroad legislation at the next session of Congress are much more doubtful than they appeared a few weeks ago.

Whereas previous statements from the "progressives" have indicated that their chief objective was repeal of the Transportation Act or at least of its rate-making provisions which the radicals have so strenuously attacked as constituting a guaranty to the railroads, Senator La Follette's statement indicates that the valuation itself is now considered of more importance, possibly for the reason that neither the courts nor the Interstate Commerce Commission could be expected to hold anything much less than 5¾ per cent to be a reasonable return even if section 15-a were repealed.

The call for the conference on valuation was issued by the committee on transportation of the "progressive" group, consisting of Senators La Follette (chairman), Ashurst, Brookhart and Sheppard; and Representatives Cooper, Huddleston and Logan, in co-operation with Governors Hunt (Ariz.), Sweet (Colo.), Kendall (Iowa), Davis (Kansas), Dixon (Mont.), Walton (Okla.), and Blaine (Wis.). In connection with the announcement Senator La Follette issued a statement saying that this conference represents "the first concerted movement to insure proper representation of the public interest in the valuation proceedings before the Interstate Commerce Commission and the courts."

"When the committee on transportation, created by the conference of progressives held on December 1, 1922, undertook its study of the railroad situation," he said, "they were impressed by the fact that the key to almost all the perplexing problems of transportation was to be found in the valuation of the roads. They also discovered that the public interest was not being properly or adequately represented in the proceedings before the Interstate Commerce Commission.

"They accordingly communicated with a number of governors, who expressed great interest in this situation on behalf of the people of their states and agreed to co-operate in bringing about a national conference to discuss and consider the matter. In this connection, it may be pointed out that the valuation act confers upon the governors special rights and duties with reference to the valuation of the roads which traverse their states. The governors who have signed this call do not, of course, include all the governors who are keenly interested in the question and who are expected to attend the conference.

"This movement for the equitable valuation of the railroads of the United States is not to be interpreted as an attack upon the Interstate Commerce Commission. Up to the present time, the commission has been in the position of having only one side—the railroads—adequately represented before it. We propose that in future the public interest shall be effectively and vigorously maintained, so that the commission will not be obliged to bear the entire burden of protecting the people's rights."

The invitation states that William E. Dever, mayor of the city of Chicago will welcome the conference, and that it is called for the following purposes:

1. To promote and to protect the public interest involved in the valuation of railroad properties now being made by the Interstate Commerce Commission, and particularly for the purpose of preventing excessive valuations of railroad properties, which will result inevitably in the imposition of unreasonable charges for railroad transportation.

2. To take the necessary steps through action before the Interstate Commerce Commission, in the courts and elsewhere to require the Interstate Commerce Commission to comply fully with the provisions of the interstate commerce act authorizing and directing the valuation of railroad properties and particularly to require the commission to perform the duties specifically imposed upon it, but which the commission has as yet failed to perform.

3. To organize, maintain and support such proceedings as may be deemed advisable to accomplish the foregoing.

"This national conference is called at this time," the invitation says, "because it has been ascertained that in the proceedings before the Interstate Commerce Commission, the public interest has not been and is not now being effectively represented with reference either to the methods of ascertaining value or the general theories upon the basis of which final values will be established. The commission is now rapidly completing its work, and in the near future will announce decisions that will be of a final character and establish precedents which it will be difficult to modify.

"The immense public interest involved in these valuation proceedings will be evident when it is realized that the difference between the valuation contended for by the railroads and the basis of valuation which is being advocated by responsible public authorities amounts to about ten billion dollars. Upon that basis will be fixed the railroad rates which may thus for all time impose an unwarranted burden of hundreds of millions of dollars annually upon American industry and agriculture and the great consuming public.

"The total stake involved is, however, much greater, because the theories and methods of valuation which are finally adopted with reference to the railroads will unquestionably be applied to all public utilities in the United States. The question is, therefore, of paramount importance to every American municipality.

"Our only purpose is that the final valuation as determined by the commission shall be just and equitable alike to railroad investors, shippers, railroad employees and the con-

suming public. To this great end we ask your counsel and co-operation."

No announcement was made regarding the list of those invited to the conference.

It is not understood that the "progressives" have by any means abandoned their fight on the Transportation Act, but the thought is rather that they have decided that their chances of success are not so great that it would not be well to have another issue than that presented by their contention that the railroads are favored with a guaranty. Although it has been rather generally taken for granted since Congress adjourned in March that the Transportation Act was destined for more or less radical amendment if not repeal at the next session, when so many of the new radicals elected last November take their seats, the return of prosperity and the changes that are coming about in some of the conditions on which the agitation against the law were based have tended to create considerable doubt as to whether any legislation will result. The wave of radicalism which swept over the country last fall, and which had its origin in a general discontent at unsatisfactory conditions, particularly among the farmers, is now reported to be rapidly subsiding and, as the prices received by the farmer have increased until freight rates are no longer relatively high, the demand for rate reductions is far less acute than it was in 1921 and the first part of 1922. The anti-railroad radicals who were elected in November received support because of their promises to bring relief from a condition which no longer prevails and which, now that it is rapidly passing, is more readily seen to have been caused by factors of far greater importance than railroad rates. Moreover, as the effects of the coal strike and the shopcrafts' strike are being overcome, railroad service is improving and if the railroads are reasonably successful in handling the record-breaking traffic of this year the radicals may find that the issues which proved so popular last fall are no longer vital.

The false claim that section 15-a guaranteed anything to the railroads has been rather effectively shown up now that three complete years have elapsed since the law was passed, during which the railroads for only one month earned as much as a 5¾ per cent basis, while the taxpayers have not been called upon to make good a cent of the deficiency. While there is now some prospect that the railroads will earn their "fair return" for 1923, it is apparent to all that rates have not been further advanced for that purpose but that there has been one general reduction and that the increased earnings are resulting from a larger volume of traffic than was ever handled when rates were lower, coupled with a greater efficiency in the control of operating expenses. During the time when delayed payments were still being made frequently on account of the guaranty for the six months following the termination of federal control, it was easy to confuse the public mind by talking as if the railroads were being guaranteed under section 15-a but now that so much of the six months' guaranty for 1920 has been paid that the balance figures very slightly in the daily news, the guaranty argument is less effective.

Leaders of the "progressives" who have remained in Washington have been very busily engaged, with the help of clerks and "experts," in collecting data and statistics for use in the coming campaign, but as the conditions which have furnished them with ammunition in the past have been succeeded by an entirely new set of conditions it has been necessary to change their tactics and apparently the attack is now to be concentrated on the valuation, which under any law of rate-making is likely to become a progressively more important factor in determining the general level of rates to be allowed by the Interstate Commerce Commission. Senator La Follette has recently addressed an elaborate questionnaire to the Interstate Commerce Commission calling for voluminous information regarding the results of its valuation work up to date. It may be that the new interest taken in the principles of valuation by the "progressives" will result in agitation for amendment of the La Follette valuation act of 1913 and it is quite possible that they would be able to unite more effectively on a program of this kind than they would with the entire field of the "transportation problem" to range in. Much of the skepticism as to the results to be obtained by the radicals arises from the feeling that they will not be able to work together harmoniously. It is also to be remembered that while the "progressives" hold the balance of power in the new Congress, this will be effective only as a veto power unless they can succeed in lining up a majority of the Democrats.

The widespread complaint that would accompany a severe car shortage this fall, if the heavy traffic continues, would undoubtedly have far more influence upon the character of railroad legislation than would any question of either rates or valuation. The railroads are now handling a greater volume of traffic than ever before at this time of the year with less reported car shortage than in 1917, 1918 or 1920, and over 100,000 new cars as well as nearly 2,000 locomotives are on order for delivery before fall, but if business continues to increase at such a rate as to demonstrate a shortage of transportation facilities at the time of peak loading the complaints against the railroads may be expected to contend on the floors of Congress with a demand for "constructive" railroad legislation from the more conservative element. The Republican plans along this line are still in rather vague shape. Senator Cummins has mentioned several times, and the President has indicated his approval of the idea, of an amendment to the law to make the consolidations proposed by the Interstate Commerce Commission compulsory. This idea has, however, been advanced as a means of reducing rates—on the theory that it would result in considerable economies—as a sort of offset to the radical proposals for getting lower rates, and the testimony taken by Commissioner Hall at hearings throughout the west on the tentative consolidation plan has been such as to indicate that the Cummins proposal would not be especially effective in winning back western votes to the Republican party.

Secretary Hoover and the officers of the United States Chamber of Commerce have also been interested in finding a program of "constructive" railroad legislation but it may turn out that their closer study of the subject will lead to a conclusion that the remedy lies in existing laws.

John E. Benton, general solicitor of the National Association of Railway & Utilities Commissioners, makes the following comment in a circular letter addressed to members of the association:

"I assume that those who are promoting the conference intend to make a vigorous attack upon the way and manner in which the Interstate Commerce Commission valuation work has been carried on. From recent correspondence understood to have passed between Senator La Follette and the Interstate Commerce Commission, the conclusion may be drawn that Senator La Follette and those who are acting with him take the position that the requirements of the valuation act, as to ascertaining and reporting original cost as one of the elements of value, have not been complied with by the commission. It is commonly known that Dr. E. W. Bemis—one of those whom Senator La Follette called to his aid when he was drawing the valuation act—has always maintained that original cost must be reported in every case, being estimated, if not ascertainable from records. The Interstate Commerce Commission, on the other hand, has proceeded upon the theory that if the original cost was unascertainable from the carriers' accounting records there was no obligation under the law to report that element. From the language of this call, it would seem that the correctness of the commission's procedure in this, and perhaps in other respects, may be challenged, and even contested in court."

Campaign Against Rough Handling Reduces Loss

By R. G. Fagan
Superintendent of Property Protection, Southern Pacific

OF THE NATIONAL loss and damage bill, 14.4 per cent is attributed to damage to freight where the cause has not been definitely determined, while damage due to rough handling of cars comprises 17 per cent. For the year 1922, these items totalled about sixteen million dollars. According to a mechanical department executive, the freight damage bill is only one-sixteenth of the car repair bill resulting from improper handling of equipment.

In 1921 the Southern Pacific inaugurated a special drive against the rough handling of cars in an effort to remove the causes for freight loss and damage. The company endeavored to locate as definitely as possible the careless and rough handling of equipment, particularly where the equipment itself was damaged. The mechanical department tabulated inspection information showing individual cars damaged and whether they were damaged in yards or in trains. A weekly report was issued showing the division, the yard, the number of cars handled, the date damaged, the initial, the number, and the amount of damage, including labor and material costs of repairs to the cars. The report included cars damaged in yard accidents.

This report was distributed to all concerned, including yardmasters and was displayed in switch shanties, with the intention of arousing interest and developing friendly rivalry between yards handling a similar number of cars. The report also affords an opportunity of pointing definitely to any switching yard not doing satisfactory work in avoiding rough and careless handling of equipment.

The company insists on the elimination of rough and careless handling that damages equipment itself. Several of the divisions have issued instructions terming as rough handling the impact of cars at speeds greater than two miles an hour at the moment of impact. The orders also limit the number of cars in cuts handled by switch engines on switching leads to 15 to 18. This prevents damage to draft gear as well as damage to freight in cars by reason of sudden stops and starts in such switching. In this way switching has been speeded up and collisions lessened on ladder leads, although it has been necessary to put on more men per engine to ride the cars in large classification yards.

Car inspection slips are made out by car inspectors covering cars which are bad ordered to show "new break," "unfair usage," etc. When a train arrives in the terminal, the inspectors show in their reports such cars as are damaged on arrival. Yardmen are required to make a cut as near as possible to the car bad-ordered on the arrival of a train and if further damage occurs, the responsibility is charged against the yard crew. These inspection slips are checked up regularly and irregularities called to the attention of superintendents and their junior officers.

The following is a summary of the report for the week ended July 15, 1922, and shows the amount of damage per thousand cars handled.

Division	Amount of damage	Number of cars handled	Amount of damage per 1,000 cars handled
Western	...	32,602	...
Stockton	...	15,066	...
Sacramento	$85	24,526	$3.47
Salt Lake	...	34,462	...
Shasta	35	15,886	2.20
Portland	...	17,781	...
Coast	25	37,081	.67
San Joaquin	75	19,897	3.77
Los Angeles	140	38,746	3.61
Tucson	...	29,172	...
Total	$360	265,219	$1.36

If all railroads strive to secure results as well or better in the handling of cars in yards, and continue the work, freight loss and damage from this cause will be reduced to a minimum. The freight loss and damage charged to "unlocated damage" will also be largely reduced. As the railroads eliminate rough handling, interline freight loss and damage on this account will decrease proportionately and alike for all concerned.

Our success so far is indicated in the figures shown below.

Year	No. cars damaged	Decrease under previous year	Amount of damage	Decrease under previous year
1920	2,709	.....	$161,653.90	.....
1921	1,213	55 per cent	68,294.40	58 per cent
1922	753	38 per cent	46,123.16	33 per cent

The decrease in "number of cars damaged" and the "amount of damage," in 1922 as compared with 1920 is 72 per cent in each instance.

A Method for Reducing Freight Claims

IN A JOINT MEETING of the general committee and the Committee on Freight Claim Prevention of the Freight Claim division of the American Railway Association with the Southeastern Claim Conference and the Chattanooga shippers on April 24 at Chattanooga, E. L. Candler, assistant general manager of the Central of Georgia, discussed the subject of loss and damage to freight by rough handling in transit and outlined a remedy for its prevention, in part as follows:

"Tests of impact registers show that 99 per cent of the rough handling occurs in the yards. Unfortunately, the employees switching cars are harder to reach and impress with any question dealing with economical operation than employees in other departments. The remedy is to direct educational work to all yard employees; to hold frequent meetings with yard employees; to keep all yard employees advised as to what rough handling means and instill into them a spirit of pride in their work so as to prevent the loss of much money by damaging cars and contents; to specialize on the proper makeup of trains in terminals; to require a more rigid inspection of equipment before being loaded and while trains are being made up at terminals; to keep hand brakes in good order at all times; to require agents to be more specific in the information given on damage exceptions and to analyze claims that are paid to determine the ratio of rough handling as between interline and line movements.

"In addition, I now have under consideration the plan of detaching three men and assigning them to educate and instruct everyone as to the better loading and proper handling of cars and to act as a special committee to deal exclusively with the subject of rough handling. In selecting such a committee, I have in mind as members an agent from one of the largest stations, a trainmaster and a terminal superintendent or general yardmaster.

"The improper handling of freight, which includes rough handling, is a transportation responsibility and the operating department cannot evade it. It is necessary to urge the operating heads from the general manager to the division superintendent, to keep thoroughly posted as to the conditions that confront one in connection with losses due to rough handling, not only on their lines but on other lines. Those who are of the opinion that careful handling of cars in terminals and switch yards necessarily means a slow down in yard operation, will soon be convinced that it is a mistaken idea and they will have the yard work given such supervision as will insure careful and proper handling of cars when in switching service."

General News Department

W. M. Daniels has resigned as Interstate Commerce Commissioner to become Strathcona professor of transportation at Yale University.

The machine shops of the Esquimalt & Nanaimo at Wellington, Vancouver Island, were completely destroyed by fire on April 30. The loss is estimated at $80,000.

A Southeastern regional conference was held by representatives of railroads in the American Short Line Railroad Association at Atlanta, Ga., on May 3 and 4. D. M. Goodwyn, chairman of the fourth section committee of the Southern Freight Association, described the growth and progress of short line railroads in the development of the South. The proposed erection of a national transportation institute in Chicago was explained by Bird M. Robinson, president of the association. The object of the school, he said, will be to instruct young men in the traffic problems, qualifying them to be traffic managers. There is at present no place in America where the transportation situation, in all its complicated aspects, is being comprehensively studied from an impartial point of view. All the studies that are being made now are from a partisan angle; either by the railroads themselves or by traffic organizations representing commercial interests.

A Correction

In the *Railway Age* for May 5, 1923, the Pennsylvania Railroad locomotive illustrated on page 1091, was incorrectly referred to as Class L1s. As is clearly shown by the wheel arrangement, this locomotive was of the 2-10-0, or Decapod type, which is designated as Class I1s.

Twenty-five Passengers Killed in Cuba

A collision of passenger trains on the Hershey Cuban Railway near Canasi, Cuba, about 60 miles from Havana on May 6 resulted in the death of 25 persons and the injury of about 50. The wreck took fire and some of the victims were burned to death.

Investigation Into Efficiency May 16

The Interstate Commerce Commission's investigation into the efficiency and economy of railroad management has been assigned for hearing at Washington on May 16 and the hearing set for May 9 for the continuation of testimony as to the Lehigh Valley has been cancelled.

The Shop-Crafts Injunction

Notwithstanding the absence of labor representatives, the hearing of the plea of the attorney general to make permanent the temporary injunction against strike violence by railroad shopmen was reopened in Chicago on May 2. Additional testimony of instances of violence on the part of the striking shopmen was introduced by federal officers. During the hearing it was declared that the cost of the strike to the government in money paid to investigators, attorneys and deputy marshals, was $1,900,022.

Across the Continent in Twenty-seven Hours

On Wednesday and Thursday of last week, May 2 and 3, the United States Army monoplane, T-2, piloted by Lieutenants O. G. Kelly and J. A. MacReady, was flown from Hempstead, N. Y., near New York City, to Rockwell Field, near San Diego, Cal. without a stop, in 26 hours, 50 minutes, 48.4 seconds. The start was made at 12:36:53 p. m. Eastern Standard Time and destination was reached at 12:27 p. m. Pacific Time. The airplane passed over Dayton, Ohio, at 6:55 p. m. E. T.; Terre Haute, Ind., 8:30 p. m. E. T.; St. Louis, Mo., 10:15 p. m. E. T.; Kansas City, Mo., 1 a. m. E. T. The airplane started with 780 gallons of gasoline, 32 gallons of oil and 25 gallons of water. These, with other weights, made a total of more than 2½ tons. The distance traversed is calculated as 2,060 miles.

French Foundryman Studies American Methods

Emile Ramas, administrator-director of the French Metallurgical Society and president of the Foundrymen's Association of Paris, France, is now visiting the United States studying the manufacture of chilled car wheels for the purpose of extending their use in France. In the course of his investigations he has been the guest of George W. Lyndon, president of the Association of Manufacturers of Chilled Car Wheels, in Chicago, and of the American Foundrymen's Association at Cleveland, Ohio.

Meeting of Western Society of Engineers

Valuation of the Railways was the subject for discussion before the railroad section of the Western Society of Engineers, at Chicago, on Monday evening, May 7, when three speakers discussed various phases of this problem. "Value" in its broader aspects was discussed by John S. Worley, professor of railway administration, University of Michigan, and Leslie Craven, counsel for Presidents' Conference Committee, Western group. H. S. Marshall, valuation engineer, Chicago, Burlington & Quincy, presented a paper on "Methods for the Appraisal of Land."

A Limited Station Agent

The Board of Railway Commissioners of Canada, acting on the application of residents of Beaufield, in the Province of Saskatchewan, has ordered the Canadian National Railway to appoint a caretaker at Beaufield station, "whose duties will be to keep the station building clean and, when necessary, heated and lighted for the arrival of passenger trains, see that package freight and express shipments are properly housed, keep the freight shed locked and a notice posted that shipments will be received and delivered between the hours of 8 a. m. and 5 p. m., and thirty minutes previous to the arrival of mixed trains Nos. 151 and 152."

New Jersey Railroad Taxes for 1921

The New Jersey Court of Errors and Appeals in an opinion issued on May 4, sustained the Supreme Court in its decision that the State Board of Taxes and Assessments proceeded properly when it applied the average tax rate of $3.44 for 1921 to railroad property assessed for that year. The railroads contended that the average rate of $3.26, fixed for 1920, should have been applied.

Sixty-four railroads participated in the appeal. Subsequent legislation has removed the uncertainty in the taxing act which formed the basis of the litigation now disposed of. It is estimated that the state will receive approximately $1,000,000 in railroad taxes over those already paid for 1921 in accordance with this opinion.

C., P. & St. L. Still Losing Money

The Illinois Senate committee on transportation, has been trying to interest Henry Ford in the purchase and rehabilitation of the Chicago, Peoria & St. Louis, but without success. In spite of the constant efforts being made to save the road from abandonment, an operating loss of $29,488 was incurred during the month of March, according to the report of the receivers. Revenues for the month amounted to $209,397, but the expenses totaled $238,887. At the beginning of April, the cash assets of the company were only $107,113.

Not the Province of Parliament to Examine Qualifications of C. N. R. Officers

Debate on May 4 on a bill to permit the Canadian National to do its own express business in place of several companies brought out sharp criticism by Arthur Meighen, leader of the opposition, of the administration of the Canadian National. The bill was fostered by the Ministry of Railways. Mr. Meighen charged that no serious attempt had been made to secure the full advantage of the amalgamation of the several government owned lines into the Canadian National. He said that an attempt had been made to find a place for all officers of the old companies on the staff of the C. N. R. with a sufficiently dignified title for his new office. G. P. Graham, Minister of Railways, who fostered the express bill, took the position that it was not the province of Parliament to inquire into the individual qualifications of each and every man appointed to office by the Canadian National Railways.

Net for March Reaches "Fair Return" Per Cent

The net railway operating income of the Class I railroads for March amounted to $83,568,473, or at the rate of 5.84 per cent on an annual basis on the tentative valuation of the railroads as fixed by the Interstate Commerce Commission, plus additions and betterments. The rate was computed by the Bureau of Railway Economics after taking into account seasonal fluctuations in traffic and earnings. This is the first time the return for a month has been as high as 5¾ per cent since that rate was fixed by the Interstate Commerce Commission as constituting a fair return for the period subsequent to March 1, 1922, when the rate of 5½ per cent as prescribed in the Transportation Act for two years, plus the ½ per cent allowed by the commission, expired by limitation. The railroads in March last year had a net railway operating income of $83,487,078, which was on the basis of an annual return of 5.96 per cent, but the rate of 5¾ per cent had not then been announced by the commission. Although the amount of net in March this year was slightly greater than that of March last year, the percentage is somewhat lower because of the additional property investment for the year 1922.

For the three months ended with March, the net operating income this year was $183,124,865, which represents an increase of 13.98 per cent as compared with the corresponding period of last year and a rate of return of 5.13 per cent as compared with 4.6 per cent last year. The eastern railroads in March had a net railway operating income at the rate of 7.09 per cent and the southern roads 6.6 per cent, but the net for the western roads was only 4.23 per cent. Operating revenues for March were $435,541,000, an increase of 12.7 per cent as compared with March last year and the operating expenses were $417,913,000, an increase of 15.73 per cent. The maintenance expenses for the month totaled $183,441,000, an increase of 15 per cent. This included $126,301,000 of maintenance of equipment, which was an increase of nearly 19 per cent.

Incomplete reports indicate that the freight traffic in March approximated 39,000,000,000 net ton miles, the greatest for that month in the history of the railroads and an increase of about 19 per cent as compared with March last year. Thirty-five railroads in March had operating deficits, of which 13 were in the eastern, one in the southern and 21 in the western districts. In February 59 roads had operating deficits. The preliminary figures as compiled by the Bureau of Railway Economics are shown in the table.

Item and district	Month of March 1923	Month of March 1922	Per cent of increase	Three months' period ended March 31 1923	Three months' period ended March 31 1922	Per cent of increase
Total Operating Revenues:						
East District (incl. Poca. Reg.)	$275,334,209	$243,148,976	13.24	$751,592,712	$644,792,914	16.56
Southern District (excl. Poca. Reg.)	73,395,255	62,003,150	18.37	204,764,779	166,871,487	22.71
Western District	186,811,967	170,047,773	9.86	528,337,082	460,661,917	14.69
Total—United States	535,541,431	475,199,899	12.70	1,484,694,573	1,272,326,318	16.69
Total Maintenance Expenses:						
Eastern District (incl. Poca. Reg.)	93,590,099	80,947,389	15.62	266,134,420	220,346,291	20.78
Southern District (excl. Poca. Reg.)	23,693,756	20,725,470	14.32	67,076,102	57,156,177	17.36
Western District	66,157,991	57,766,345	14.53	186,634,714	162,828,267	14.62
Total—United States	183,441,846	159,439,204	15.05	519,845,236	440,330,735	18.06
Total Operating Expenses:						
Eastern District (incl. Poca. Reg.)	214,627,801	181,463,782	18.28	618,369,972	509,663,719	21.33
Southern District (excl. Poca. Reg.)	54,359,803	47,132,750	15.33	154,785,669	133,061,688	16.33
Western District	148,925,583	132,519,100	12.38	429,672,696	380,483,000	12.93
Total—United States	417,913,187	361,115,632	15.73	1,202,828,337	1,023,208,407	17.55
Net Railway Operating Income:						
Eastern District (incl. Poca. Reg.)	44,074,353	47,819,565	d 7.83	85,872,914	96,398,564	d 10.92
Southern District (excl. Poca. Reg.)	14,518,438	11,095,349	30.85	37,417,171	22,838,247	63.84
Western District	24,975,682	24,572,164	1.64	59,834,780	41,429,727	44.42
Total—United States	83,568,473	83,487,078	0.10	183,124,865	160,666,538	13.98
Rate Earned—Annual Basis:						
Eastern District (incl. Poca. Reg.)	7.09	7.87	.....	5.65	6.50	.....
Southern District (excl. Poca. Reg.)	6.60	5.15	.....	6.69	4.17	.....
Western District	4.23	4.24	.....	4.01	2.83	.....
Total—United States	5.84	5.96	.....	5.13	4.60	.....

d Denotes decrease.

Nationwide Investigation Into Apprentice System

Appointment of a committee to make a nationwide investigation of the apprentice system has been announced by the American Management Association, composed of many of the country's largest industrial enterprises. The committee, headed by L. L. Park, supervisor of welfare, American Locomotive Company, Schenectady, N. Y., was named by the Plant Executives' Division of the Association, of which Sam A. Lewisohn of New York, vice-president of the Miami Copper Company, is chairman.

Modernizing American apprentice systems is one of the aims of the committee, according to Mr. Lewisohn, who said: "Several states are planning modern apprenticeship laws and it is desirable that there should be uniformity in these measures."

Other members of the committee include: L. A. Wilson, director of the National Society for Vocational Education, Albany, N. Y.; Milton D. Gehris, vice-president, John B. Stetson Company, 1801 Germantown avenue, Philadelphia; E. W. Gressle, employment manager, the Warner & Swasey Company, Cleveland; Burt L. Fenner, McKim, Mead & White, New York; Franklin T. Jones, supervisor of training, the White Motor Company, Cleveland; Stanley Zweibel, director of service, Nordyke & Marmon Company, Indianapolis; Robert H. Spahr, department of engineering extension, Pennsylvania State College, Philadelphia; James P. Garvey, Works Training Division, Western Electric Company, Chicago; Walter S. Berry, director of training, Scovill Manufacturing Company, Waterbury, Conn.; L. S. Hawkins, director of the Department of Education, United Typothetæ of America, Chicago; I. B. Shoup, director of personnel and training, Marion Steam Shovel Company, Marion, O.; A. C. Lampman, supervisor of apprentices, National Cash Register Company, Dayton, O.; P. E. Wakefield, educational director, Carnegie Steel Company, Pittsburgh.

The findings of the committee will be embodied in a report, one of a series to be presented to the fall convention of the association dealing with the human factor in commerce and industry. It is the plan of the committee to touch upon such phases of the subject as will aid in the promotion of apprentice schools and of training courses in various types of industry along the most approved and successful lines.

Chairman Lewisohn also announces the personnel of the Plant Executives' Division, which includes representation from the steel, iron, brass, clothing, electrical and other trades, as well as railroads and other public utilities, as follows:

Elisha Lee, vice-president, Pennsylvania Railroad; John H. Goss, vice-president, Scovill Manufacturing Company, Waterbury, Conn.; E. K. Hall, vice-president, American Telephone & Tele-

graph Company; Robert B. Wolf, New York, past vice-president of the American Society of Mechanical Engineers; Charles R. Hook, vice-president, American Rolling Mill Company, Middletown, O.; W. E. Hotchkiss, director of the National Industrial Federation of Clothing Manufacturers, Chicago; E. S. McClelland, personnel director of the Westinghouse Electric & Manufacturing Company, Pittsburgh; C. S. Ching, supervisor of industrial relations, U. S. Rubber Company, New York; Alfred L. Ferguson, vice-president, Consolidated Textile Corporation, New York; Leigh Best, vice-president, American Locomotive Company, New York; A. H. Young, manager of industrial relations, International Harvester Company, Chicago; George J. Anderson, industrial relations counsel, Curtis, Fosdick & Belknap, New York; E. G. Draper, treasurer, Hills Brothers Company, New York; J. M. Larkin, assistant to the president, Bethlehem Steel Company, Bethlehem, Pa.; Milton D. Gehris, vice-president, John B. Stetson Company, Philadelphia.

The Denver Exhibit of the Air Brake Appliance Association

A total of 22 companies, members of the Air Brake Appliance Association, were represented by exhibits at the Albany Hotel, Denver, Colo., during the convention of the Air Brake Association which was held May 1, 2 and 3, 1923. At the annual meeting of the exhibiting organization, held during the convention of the railroad organization, the following officers were elected to serve during the coming year:

Lewis B. Rhodes, Jr. (Vapor Car Heating Company), president; Joseph Sinkler (Pilot Packing Company), secretary-treasurer.

The list of exhibitors is as follows:

Ashton Valve Company, Boston, Mass.—Quadruplex air brake gage, recording gages, steam gages; dead weight testers, driving wheel quartering gage, wheel press recording gage, three-speed recording gage and safety valves. Represented by J. F. Gettrust and Charles Gaston.

Barco Manufacturing Company, Chicago.—Engine-tender connections, reservoir flexible joints, car steam heat connection, automatic smoke box blower fittings and model of crosshead and shoes. Represented by C. L. Mellor.

Crane Company, Chicago.—Locomotive cab valves, railroad unions and fittings. Represented by John B. Jordan and F. W. Venton.

Detroit Lubricator Company, Detroit, Mich.—Automatic exhaust nozzle covers; flange oiler; hydrostatic lubricators and lubricator transfer filler. Represented by C. H. Perrine.

Joseph Dixon Crucible Company, Jersey City, N. J.—Brake cylinder lubricant, triple valve graphite, flake graphite, graphite cup grease, belt dressing, gear and differential lubricants and graphite pipe joint compound. Represented by L. H. Snyder and G. D. Hulseman.

Edna Brass Company, Cincinnati, Ohio.—Non-lifting injectors, lifting injectors, force feed lubricator, hydrostatic lubricators and locomotive water column. Represented by E. O. Corey and R. D. Oatman.

J. B. Ford Company, Wyandotte, Mich.—Literature. Represented by Harry R. Enoch.

Walter H. Foster Company, New York.—Photographs of semi-automatic valve finishing machine. Represented by H. L. Kenah.

Garlock Packing Company, Palmyra, N. Y.—Gaskets for railroad service, cab cock packing, and high pressure spiral packing. Represented by Robert Todd and C. W. Sullivan.

Johns-Manville, Inc., New York.—Power reverse gear packing cups, air brake expander rings, air pump packing, steam and air end, packing for power reverse gear piston rods, Mallet ball and slip joint packings, and pipe insulation. Represented by P. C. Jacobs and C. D. Biggerstaff.

Leslie Company, Lyndhurst, N. Y.—Steam heat and electric headlight pressure regulators. Represented by J. J. Cizek.

W. H. Miner, Chicago.—Hand brake. Represented by J. R. Mitchell.

Nathan Manufacturing Company, New York.—Locomotive force feed lubricator. Represented by J. E. Brandt.

New York Air Brake Company, New York.—Centrifugal air pump strainer; cab signal valve, feed valve and oil atomizing lubricator for air end of air pumps. Represented by Thomas O'Leary, Jr.; Frank A. Geister and E. P. Wentworth.

New York & New Jersey Lubricant Company, New York.—Non-fluid oil brake cylinder lubricant and non-fluid triple valve lubricant. Represented by James H. Bennis.

Pilot Packing Company, Chicago.—Air pump packings, throttle stuffing box packings, packing for stationary power plants, and Ripken automatic drifting valve. Represented by Joseph Sinkler.

Pratte Vacuum Air Sander Company, Denver, Colo.—Vacuum air sander, and ash pan sprinkler and cleaner. Represented by C. A. Pratte and C. E. Fuller, Jr.

Railway Devices Company, St. Louis, Mo.—Forged steel brake jaws, angle cock, air brake pipe holders, and spiral pipe clamps. Represented by Sterling Campbell.

Schaefer Equipment Company, Pittsburgh, Pa.—Truck lever connections; self-locking brake hangers; drop forged truck levers, and drop forged brake rod jaws. Represented by E. J. Searles, H. G. Doran and C. E. Fuller, Jr.

Simmons-Boardman Publishing Company, New York.—Railway Age, Railway Mechanical Engineer, Car Builders Cyclopedia, Locomotive Cyclopedia and Railway Electrical Engineer. Represented by M. H. Learnard and C. B. Peck.

Vapor Car Heating Company, Chicago.—Steam heat reducing valve, steam heat stop valves, flexible metallic conduits and steam hose couplers. Represented by Lewis B. Rhodes, Jr.

Westinghouse Air Brake Company, Pittsburgh, Pa.—Pump cylinder head gaskets, brake cylinder packing cups, air pump strainer, automatic air cylinder oil cups and literature. Represented by C. J. Olmstead, L. M. Carleton, T. W. Newburn, W. E. Dean, H. J. Robinson, C. C. Farmer, A. S. Husters, John Hume, F. B. Johnson, R. T. Cunningham, John B. Wright, S. G. Down, A. C. Layton, C. D. Stewart, F. H. Parke and A. L. Berghane.

Program for Purchases and Stores Meeting

The Purchases and Stores division of the American Railway Association has issued a detailed program of the fourth annual meeting to be held in the convention hall of the Hotel Sherman May 15-17. The meeting will convene at 10:00 a. m., city time, on Tuesday and members are requested to be in attendance promptly. The detailed program is as follows:

Tuesday, May 15—Morning Session

Meeting called to order by chairman	10.00
Invocation	10.00 to 10.10
Remarks by J. H. Waterman	10.10 to 10.30
Address by R. H. Aishton, President, American Railway Association	10.30 to 10.45
Address by W. G. Besler, first vice-president, American Railway Association	10.45 to 11.00
Address by chairman	11.00 to 11.15
Communications	11.15 to 11.20
Appointment of Committees (Resolutions and Memorials)	11.20 to 11.25
Action on minutes of 1922 meeting	11.25 to 11.30

Recess

New Business—Presentation and discussion of reports on:	
Report of General Committee	11.35 to 11.40
Subject 1, Stores Department Book of Rules	11.40 to 11.50
Subject 2, Classification of Material	11.50 to 12.00

Afternoon Session

Presentation and discussion of reports on:	
Subject 6, Stores Department Building and Facilities for Handling Materials	2.00 to 2.45
Special subject: Need of Apprentices in Storehouse Organization, by J. W. Gerber	2.45 to 3.00
Subject 4, Material Accounting and Office Appliances	3.00 to 3.30
Special subject: Savings to be Effected in the Handling of Paints, Oils and Similar Products by the Use of Metal One-Time Shipping Container, by J. C. Kirk	3.30 to 4.15
Subject 14, General Accounting	4.15 to 4.30
Special subject: Factors to be Considered in the Storage of Coal, by B. P. Phillippe	4.30 to 5.00

Wednesday, May 16—Morning Session

Presentation and discussion of reports on:	
Subject 11, Unit Filing of Materials and Numerical Marking System (illustrated by stereopticon views)	9.00 to 10.00
Special subject: The Railway Stores Catalogue, by C. D. Young	10.00 to 10.45
Subject 12, Purchasing Agents' Office Records and Office Organization	10.45 to 11.00
Subject 5, Forest products	11.00 to 11.30
Special subject: Most Economical Method of Handling Repairs to Typewriters, Calculating Machines and Other Office Appliances, by W. W. Griswold	11.30 to 12.00
Moving Pictures of Scrap Handling, General Store, C. R. I. & P., Silvis, Ill	12.00 to 12.30

Afternoon Session

Presentation and discussion of reports on:	
Subject 3, Reclamation and Conservation of Discarded Material and Classification of Scrap (illustrated by moving pictures)	2.00 to 3.30
Special subject: Reclamation of Grain Doors, by Oliver Maxey	3.30 to 4.00
Subject 8, Supply Train Operation and Line Delivery of Material	4.00 to 4.30
Special subject: Application of Commercial Business Principles in Railroad Storekeeping, by R. J. Elliott	4.30 to 5.00

Thursday, May 17

Presentation and discussion of reports on:	
Subject 15, Store Delivery of Material to the Users at Shops	9.00 to 10.00
Subject 9, Joint Committee on Fuel Conservation	10.00 to 10.15
Subject 10, Joint Committee on Joint Inspection of Standard Materials	10.15 to 10.30
Special subject	10.30 to 10.45
Subject 7, Workable Rules for the Carrying Out of the Provisions of Section 10 of the Clayton Anti-Trust Act	10.45 to 11.00
Report of Resolutions and Memorials Committees	11.00 to 11.15
Report of Nominating Committee and Election of Officers	11.15 to 11.30

Adjournment

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF MARCH AND THREE MONTHS OF CALENDAR YEAR 1923

Name of road		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rentals.	Net after rentals 1922.
Akron, Canton & Youngstown	Mar.	170	$206,226	$1,074	$216,527	$28,479	$22,861	$7,476	$65,391	$9,232	$133,439	61.60	$83,088	$69,012	$49,593	$58,619
	3 mos.	170	575,038	2,778	609,987	80,729	59,339	22,117	186,380	26,663	375,228	61.50	234,759	194,269	129,975	149,841
Alabama & Vicksburg	Mar.	141	198,585	53,538	272,471	42,642	58,928	9,126	102,234	11,549	226,427	83.10	46,044	24,651	34,876	45,779
	3 mos.	141	617,842	162,056	840,688	112,914	158,321	27,244	317,494	34,345	655,606	78.00	185,082	112,265	144,917	71,477
Vicksburg, Shreveport & Pac.	Mar.	171	239,162	92,612	361,512	42,439	63,704	10,449	119,434	13,489	252,042	69.70	109,470	81,935	71,019	46,941
	3 mos.	171	691,587	269,204	1,047,685	134,302	184,545	30,488	358,692	39,169	754,784	72.00	292,901	215,330	182,023	83,604
Ann Arbor	Mar.	293	216,097	36,632	270,699	56,420	100,569	8,458	184,127	12,595	362,169	133.80	—91,470	—113,932	—151,486	66,602
	3 mos.	293	880,659	113,485	1,044,480	120,072	347,105	26,481	600,336	39,246	1,133,139	108.50	—88,659	—156,028	—255,258	100,378
Atchison, Top. & Santa Fe	Mar.	8,947	11,690,005	3,433,640	16,551,784	1,748,956	3,971,166	281,167	5,356,257	348,569	11,554,572	69.80	4,997,222	3,822,946	4,107,772	2,600,346
	3 mos.	8,944	32,559,441	10,711,165	47,171,141	4,568,794	11,347,111	845,090	15,540,912	1,033,174	33,149,906	70.30	14,021,235	10,282,065	10,975,036	5,073,577
Gulf, Colo. & Santa Fe	Mar.	1,908	1,381,327	303,469	1,817,505	398,400	485,812	43,660	659,340	66,370	1,648,930	90.70	168,575	85,669	46,515	62,433
	3 mos.	1,908	4,259,315	914,863	5,511,909	1,098,747	1,418,777	134,420	1,948,431	194,085	4,788,512	86.90	723,397	478,384	319,143	—340,231
Panhandle & Santa Fe	Mar.	858	507,895	111,276	652,404	126,174	210,422	7,432	212,489	18,538	574,808	88.10	77,596	53,686	30,418	27,215
	3 mos.	858	1,380,033	315,776	1,793,444	254,913	575,010	23,239	600,573	55,722	1,506,709	84.00	286,735	214,061	133,094	—93,047
Atlanta & West Point	Mar.	93	151,725	71,448	252,381	27,348	37,974	9,476	86,775	11,345	176,242	69.80	76,139	57,417	45,948	6,423
	3 mos.	93	420,135	220,539	716,312	87,238	125,832	26,392	257,489	34,194	541,574	75.60	174,738	129,496	86,698	—10,357
Western of Alabama	Mar.	133	167,715	64,586	256,449	28,082	46,147	10,744	80,390	11,473	179,755	70.10	76,694	57,516	54,711	23,872
	3 mos.	133	459,397	202,743	723,135	87,036	137,884	29,735	239,608	34,001	537,200	74.30	185,935	142,355	134,627	37,388
Atlanta, Birm. & Atlantic	Mar.	639	352,549	44,479	421,797	73,177	90,950	22,441	205,103	15,611	407,350	96.50	14,447	1,075	—8,580	—54,737
	3 mos.	639	1,001,059	129,569	1,199,388	195,611	264,392	68,695	608,216	45,335	1,182,499	98.60	16,889	—24,452	—60,710	—231,324
Atlantic Coast Line	Mar.	4,859	5,900,963	1,879,959	8,378,952	743,372	1,456,452	115,940	2,796,685	149,120	5,318,006	63.50	3,060,946	2,684,333	2,538,339	2,051,822
	3 mos.	4,860	15,557,512	5,706,605	22,761,159	2,199,514	4,011,397	342,275	7,759,802	422,849	14,882,232	65.40	7,878,927	6,801,126	6,453,025	4,440,260
Charleston & West. Carolina	Mar.	342	359,526	34,311	409,922	55,046	47,621	7,149	152,332	6,519	268,667	65.50	141,255	130,265	108,520	107,758
	3 mos.	342	883,445	103,278	1,027,378	142,890	123,848	20,513	412,911	19,633	719,795	70.00	307,583	274,536	226,808	149,407
Baltimore & Ohio	Mar.	5,212	19,119,732	2,283,747	22,747,280	2,190,729	5,618,207	310,509	8,425,269	476,819	17,149,739	75.40	5,597,541	4,754,750	4,381,004	3,081,212
	3 mos.	5,212	51,948,243	6,441,781	61,996,643	6,291,166	14,300,887	950,441	24,368,288	1,432,144	47,703,078	76.90	14,293,565	11,798,531	10,512,656	6,675,442
Baltimore & Ohio Chic. Term	Mar.	83	.....	.....	321,439	27,703	48,461	2,903	193,573	9,847	286,576	89.20	34,863	—5,615	55,446	144,234
	3 mos.	83	.....	.....	877,957	47,528	117,604	6,335	554,021	29,713	767,592	87.40	110,365	—18,760	123,902	296,943
Staten Isl. Rapid Transit	Mar.	23	81,745	86,964	186,857	30,076	43,698	1,923	117,443	12,977	206,117	110.30	—19,260	—36,860	—58,175	—27,543
	3 mos.	23	229,960	240,567	517,480	84,724	110,393	5,453	341,986	40,599	583,155	112.70	—65,675	—118,417	—169,005	—160,528
Bangor & Aroostook	Mar.	616	557,447	84,577	668,267	160,425	126,955	4,811	218,269	14,551	525,958	78.70	142,309	102,204	157,484	339,054
	3 mos.	616	1,356,223	230,846	1,655,334	379,856	368,111	13,250	602,185	52,819	1,420,036	85.80	235,298	125,889	271,920	715,681
Belt Ry. of Chicago	Mar.	32	.....	.....	624,679	48,897	58,947	2,194	298,980	9,724	418,742	67.00	205,937	143,190	131,700	144,074
	3 mos.	32	.....	.....	1,797,749	109,663	195,060	6,886	873,045	29,518	1,214,172	67.50	583,577	456,152	435,746	429,195
Bessemer & Lake Erie	Mar.	228	1,169,957	33,843	1,231,792	77,836	420,258	13,946	403,627	26,010	941,028	76.40	290,764	261,562	509,431	68,044
	3 mos.	228	3,163,889	93,106	3,333,719	215,020	1,191,062	43,844	1,150,286	82,281	2,694,701	80.80	639,018	551,402	1,291,410	—53,412
Bingham & Garfield	Mar.	34	35,698	5	38,059	6,251	4,559	1,267	9,400	3,998	25,654	67.30	12,445	4,951	16,717	—27,236
	3 mos.	34	98,890	15	103,282	14,476	13,605	4,195	25,327	11,132	69,339	67.10	33,943	12,008	47,993	—71,705
Boston & Maine	Mar.	2,286	4,683,405	1,917,691	7,455,326	942,207	1,657,196	51,850	3,908,044	223,735	6,808,644	91.30	646,682	423,161	—181,466	892,922
	3 mos.	2,286	11,880,117	5,531,245	19,699,485	3,205,124	4,901,867	150,096	11,272,727	650,374	20,251,734	102.80	—552,249	—1,260,761	—2,962,361	1,133,424
Brooklyn East. Dist. Term	Mar.	9	158,382	.....	167,309	5,859	17,404	30	51,899	5,783	80,975	48.40	86,334	74,446	74,606	66,923
	3 mos.	9	406,974	.....	435,332	15,437	43,037	612	149,343	16,357	224,786	51.60	210,546	186,631	186,791	144,304
Buffalo & Susquehanna	Mar.	253	264,582	6,918	275,346	38,141	79,144	2,107	85,272	8,861	213,525	77.50	61,821	44,221	105,743	50,148
	3 mos.	253	754,988	18,711	784,759	108,786	240,483	6,082	256,309	25,985	637,645	81.30	147,114	102,013	265,087	141,803
Buffalo, Rochester & Pittsburgh	Mar.	589	1,995,727	156,322	2,225,361	265,638	705,647	28,907	832,380	45,688	1,880,144	84.50	345,217	310,213	387,322	325,156
	3 mos.	589	5,719,164	445,378	6,353,536	640,750	2,258,262	76,277	2,462,065	127,981	5,571,794	87.70	781,742	676,549	945,414	756,143
Canadian Pacific (Lines in Me.)	Mar.	233	257,792	41,401	316,132	27,449	68,472	3,513	146,966	3,748	250,148	83.90	65,984	50,984	41,501	62,280
	3 mos.	233	797,972	113,098	962,854	74,373	180,190	13,572	459,833	11,762	739,730	76.80	223,124	178,124	144,191	77,024
Carolina, Clinch. & Ohio	Mar.	309	745,193	43,038	802,067	70,480	195,473	24,977	229,639	19,543	539,722	67.30	262,345	212,306	262,839	283,174
	3 mos.	309	2,025,532	119,029	2,182,435	180,126	586,886	73,910	659,044	57,662	1,556,821	71.30	625,614	475,436	610,769	666,588
Central of Georgia	Mar.	1,920	1,811,708	442,812	2,478,682	274,461	436,610	69,675	929,177	79,678	1,800,841	72.60	677,841	550,141	519,145	450,247
	3 mos.	1,920	4,796,229	1,399,126	6,796,167	795,736	1,267,465	213,046	2,636,414	236,187	5,177,399	76.10	1,618,768	1,281,542	1,246,585	760,474
Central of New Jersey	Mar.	694	4,012,315	689,195	5,058,274	408,685	1,501,732	34,377	2,197,375	103,183	4,265,091	84.30	793,183	487,096	354,986	1,093,253
	3 mos.	694	10,696,214	1,996,127	13,477,880	1,314,339	3,494,081	121,474	6,404,147	308,521	11,700,779	86.80	1,777,101	863,142	680,920	1,601,265
Central Vermont	Mar.	533	541,498	106,974	705,062	77,812	151,905	14,336	432,648	21,387	700,070	99.30	4,992	—15,527	—85,645	—8,415
	3 mos.	533	1,425,341	323,054	1,924,185	221,809	393,583	40,389	1,270,498	59,614	1,990,946	103.50	—66,761	—128,395	—331,948	—68,402
Chesapeake & Ohio	Mar.	2,552	6,681,666	879,766	7,979,408	1,006,007	2,173,000	86,785	2,837,479	196,161	6,328,932	79.30	1,650,476	1,345,612	1,394,568	1,736,374
	3 mos.	2,552	18,875,611	2,446,909	22,441,878	2,496,792	6,235,178	251,447	8,271,814	539,780	17,876,948	79.70	4,564,930	3,652,017	3,829,221	4,204,413
Chicago & Alton	Mar.	1,050	2,067,709	529,364	2,842,685	263,373	750,338	59,510	1,016,916	58,780	2,160,864	76.00	681,821	589,111	494,142	509,570
	3 mos.	1,050	6,010,381	1,545,171	8,205,705	800,527	2,352,060	171,400	3,025,985	175,443	6,559,577	79.90	1,646,128	1,390,278	1,058,901	1,154,300
Chicago & Eastern Ill	Mar.	945	1,962,741	383,945	2,541,687	248,782	698,729	47,521	1,015,350	71,669	2,095,086	82.40	446,601	326,463	417,418	485,866
	3 mos.	945	5,745,677	1,147,017	7,418,227	674,123	2,231,710	134,137	2,974,724	208,071	6,259,088	84.40	1,159,139	836,241	1,077,820	1,063,787
Chicago & North Western	Mar.	8,462	9,618,485	2,469,712	13,453,884	1,420,372	3,393,857	178,374	6,042,253	338,793	11,431,750	85.00	2,022,134	1,268,841	874,649	1,553,676
	3 mos.	8,462	26,977,706	6,927,736	37,432,757	3,692,736	9,569,120	508,542	17,509,686	1,004,605	32,464,690	86.70	4,968,067	2,711,191	1,990,333	1,712,169
Chicago, Burl. & Quincy	Mar.	9,393	11,313,943	2,179,967	14,813,534	1,413,249	3,354,375	219,491	5,895,920	381,724	11,356,933	76.70	3,456,601	2,530,907	2,378,718	2,896,358
	3 mos.	9,393	33,072,014	6,323,902	43,123,858	3,378,320	10,207,835	597,268	17,370,036	1,085,164	32,969,528	76.40	10,154,330	7,361,403	6,860,421	6,452,059
Chicago Great Western	Mar.	1,496	1,690,059	348,679	2,198,254	191,360	519,145	64,670	987,404	54,566	1,830,040	83.20	368,214	295,101	190,126	169,576
	3 mos.	1,496	4,711,502	1,036,345	6,204,442	529,402	1,471,440	195,869	2,829,900	164,512	5,230,910	84.30	973,532	731,554	460,461	—12,391

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF MARCH AND THREE MONTHS OF CALENDAR YEAR 1923—CONTINUED

Name of road		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rentals.	Net after rentals 1922.
Chicago, Ind. & Louisville	Mar.	657	$1,227,118	$260,906	$1,640,998	$134,014	$346,206	$32,780	$594,201	$33,179	$1,156,220	70.50	$484,778	$390,837	$239,129	$204,489
	3 mos.	657	3,283,190	719,077	4,403,909	385,226	948,691	96,628	1,710,300	104,073	3,289,599	74.70	1,114,310	898,538	506,994	425,127
Chicago, Milwaukee & St. Paul	Mar.	11,025	11,343,514	1,996,798	14,791,287	1,388,924	3,651,274	190,836	6,216,083	319,712	11,826,346	80.00	2,964,941	2,172,187	1,548,299	1,055,902
	3 mos.	11,025	32,077,650	5,613,774	41,608,208	3,597,268	10,666,314	566,521	17,942,490	944,221	33,881,363	81.40	7,726,845	5,353,411	3,972,465	—287,903
Chicago, Peoria & St. Louis	Mar.	247	83,358	15,659	107,835	18,448	21,832	2,954	62,402	9,362	114,998	106.60	—7,163	—16,663	—25,425	—13,198
	3 mos.	247	297,474	44,983	369,706	56,440	76,930	9,438	221,615	28,877	393,300	106.40	—23,594	—52,178	—94,861	—75,873
Chicago River & Indiana	Mar.	28	.....	.....	672,192	52,200	67,948	1,738	277,169	11,917	410,972	61.10	261,220	215,163	299,340	.....
	3 mos	28	.....	.....	1,879,498	151,931	217,625	4,055	768,906	32,996	1,175,513	62.50	703,985	588,638	842,099	.....
Chicago, Rock Isl. & Pacific	Mar.	7,635	7,214,009	2,125,631	10,119,407	1,246,789	2,320,964	187,259	4,519,699	246,301	8,576,168	84.70	1,543,239	1,028,873	714,036	1,288,787
	3 mos.	7,635	20,919,136	6,053,389	29,049,655	3,640,598	7,111,325	570,877	13,326,857	735,205	25,533,359	87.90	3,516,296	1,983,131	1,045,145	1,645,527
Chicago, Rock Island & Gulf	Mar.	461	325,794	68,324	432,863	95,165	78,911	12,568	227,060	13,899	428,808	99.10	4,055	—8,547	—12,660	32,146
	3 mos.	461	939,811	218,494	1,265,823	212,247	222,273	38,010	665,735	42,209	1,183,959	93.50	81,864	44,590	7,882	114,566
Chicago, St. Paul, Minn. & Omaha	Mar.	1,749	1,739,465	543,370	2,451,641	215,876	569,136	39,328	1,225,945	70,364	2,130,489	86.90	321,152	184,784	195,188	274,192
	3 mos.	1,749	4,973,726	1,521,708	6,939,322	611,737	1,478,097	106,016	3,560,001	210,154	5,991,523	86.30	947,799	535,081	580,982	259,297
Cin., Indianapolis & Western	Mar.	347	346,970	37,348	417,870	38,533	92,119	11,701	177,034	19,157	339,941	81.30	77,929	56,952	32,081	—3,083
	3 mos.	347	998,503	119,463	1,212,710	95,427	260,450	33,738	560,479	56,677	1,011,535	83.40	201,175	142,517	46,266	—7,356
Colorado & Southern	Mar.	1,099	795,445	134,411	1,007,339	116,731	330,623	13,286	430,816	44,442	942,067	93.50	65,272	991	10,840	180,521
	3 mos.	1,099	2,385,046	427,480	3,022,175	338,675	970,736	40,828	1,303,326	128,702	2,806,116	92.90	216,059	23,194	35,913	369,958
Ft. Worth & Denver City	Mar.	456	527,739	140,859	705,171	66,450	181,940	12,207	226,039	33,986	522,206	74.10	182,965	144,928	183,693	216,451
	3 mos.	456	1,543,404	435,147	2,084,642	178,392	561,044	31,532	689,732	102,764	1,569,597	75.30	515,045	387,906	496,119	465,606
Wichita Valley	Mar.	271	79,967	17,998	105,150	18,397	12,472	27	37,930	1,581	70,410	67.00	54,740	29,040	19,060	15,316
	3 mos.	271	236,636	51,624	306,806	54,444	40,042	93	122,189	5,262	221,930	72.50	84,876	66,393	36,720	26,141
Columbus & Greenville	Mar.	167	93,625	29,454	130,204	32,836	17,878	3,567	45,992	12,510	112,756	86.60	17,448	14,922	3,834	1,360
	3 mos.	167	266,861	88,624	376,293	99,166	47,230	10,042	134,970	29,238	320,578	85.20	55,715	67,108	27,282	—15,629
Delaware & Hudson	Mar.	886	3,304,444	308,680	3,836,136	341,368	1,110,464	38,425	1,780,365	136,931	3,436,296	89.60	399,840	314,263	211,470	618,998
	3 mos.	886	8,489,521	916,027	10,040,306	1,038,416	3,382,410	112,168	5,093,222	423,876	10,140,979	101.00	—100,673	—356,544	—508,631	1,994,752
Delaware, Lackawanna & Western	Mar.	993	5,581,372	1,066,977	7,533,389	596,373	1,983,311	105,249	3,409,852	170,454	6,318,463	83.90	1,214,926	802,317	908,716	1,566,092
	3 mos.	993	14,850,722	3,197,237	20,438,431	1,632,674	5,987,988	319,439	9,711,187	467,571	18,274,877	89.40	2,163,554	927,571	1,247,875	3,175,570
Denver & Rio Grande Western	Mar.	2,593	1,840,777	380,315	2,430,435	244,243	769,559	49,838	991,652	81,843	2,177,237	89.60	253,198	83,132	164,694	611,994
	3 mos.	2,593	5,693,762	1,136,191	7,458,001	768,572	2,493,309	140,926	3,099,423	247,709	6,966,071	92.10	591,930	85,713	213,417	1,628,379
Denver & Salt Lake	Mar.	255	92,190	8,902	122,450	40,035	82,812	846	51,279	5,984	180,956	147.80	—58,506	—67,531	—61,606	42,809
	3 mos.	255	329,428	36,043	425,453	106,427	227,332	2,701	187,059	17,723	541,242	127.20	—115,789	—142,868	—126,870	65,887
Detroit & Mackinac	Mar.	385	121,904	29,826	161,983	22,688	49,417	2,245	65,354	5,299	144,934	89.40	17,049	6,337	16,043	—11,926
	3 mos.	385	293,082	87,885	409,483	60,225	137,612	5,838	190,214	15,846	409,563	100.10	—480	—33,594	—1,021	—105,474
Detroit & Toledo Shore Line	Mar.	61	391,180	.....	396,191	26,798	34,795	2,142	115,730	7,096	186,561	47.90	209,630	191,330	98,692	142,745
	3 mos.	61	1,025,989	.....	1,042,327	67,084	89,558	7,335	320,945	20,351	505,273	48.50	537,054	482,154	219,282	327,493
Detroit, Toledo & Ironton	Mar.	454	899,137	10,056	926,335	114,050	175,906	6,269	320,673	24,218	625,093	.....	301,242	288,678	181,822	179,659
	3 mos.	454	2,297,201	29,742	2,376,961	254,753	481,638	19,398	920,258	69,852	1,704,392	.....	672,569	634,757	290,732	334,356
Duluth & Iron Range	Mar.	279	164,208	21,501	211,195	69,191	128,763	1,110	160,381	17,230	377,118	178.60	—165,923	—178,653	—185,269	—147,145
	3 mos.	279	448,611	62,966	586,000	177,233	375,308	3,079	481,924	53,183	1,092,048	186.40	—506,048	—541,839	—546,942	—468,147
Duluth, Missabe & Northern	Mar.	305	133,121	27,006	190,042	103,231	214,029	3,326	193,527	18,908	534,749	281.40	—344,707	—422,371	—425,099	—317,989
	3 mos.	305	317,119	69,257	469,237	297,613	589,295	8,771	540,508	62,778	1,503,920	320.50	—1,034,683	—1,264,156	—1,266,556	—926,245
Duluth, South Shore & Atlantic	Mar.	591	308,215	87,489	426,371	49,383	73,142	6,891	243,653	12,357	390,900	91.76	35,471	5,514	—11,708	—69,169
	3 mos.	591	865,542	276,640	1,231,855	133,568	224,174	18,738	720,565	34,991	1,148,238	93.20	83,617	—6,402	—38,955	—221,707
Duluth, Winnipeg & Pacific	Mar.	178	254,193	24,102	294,035	30,389	50,823	3,366	108,065	5,430	197,355	69.50	86,680	36,677	48,805	86
	3 mos.	178	636,053	72,834	727,392	92,144	126,706	10,155	310,911	16,472	555,670	76.40	171,722	101,789	111,960	—10,334
Elgin, Joliet & Eastern	Mar.	459	2,226,548	9	2,465,863	153,624	697,812	11,626	774,762	35,663	1,673,439	67.86	792,424	717,467	513,337	812,376
	3 mos.	459	6,082,768	31	6,762,009	412,362	1,832,006	35,834	2,201,187	107,897	4,589,086	67.80	2,172,923	1,948,171	1,462,511	1,672,551
El Paso & Southwestern	Mar.	1,139	822,478	166,327	1,043,830	184,148	228,254	30,043	305,680	41,579	798,216	76.50	245,614	145,353	113,372	97,984
	3 mos.	1,139	2,310,680	546,686	3,019,567	570,121	635,028	90,162	846,007	122,739	2,293,492	76.00	726,075	474,821	456,441	353,322
Erie	Mar.	2,039	9,284,180	1,052,283	11,057,119	861,759	3,047,672	141,758	4,683,159	282,013	9,067,545	82.00	1,989,574	1,644,631	1,611,740	1,666,186
	3 mos.	2,039	25,081,187	3,033,314	30,025,753	2,513,799	8,887,378	417,829	13,639,026	826,930	26,419,398	88.00	3,606,355	2,645,748	2,688,344	3,146,357
Chicago & Erie	Mar.	269	1,041,917	53,503	1,189,164	101,289	212,983	22,654	488,452	38,519	864,731	72.70	324,433	271,779	—1,858	—82,114
	3 mos.	269	2,809,809	145,938	3,156,830	282,340	590,840	60,328	1,468,419	114,601	2,515,554	79.70	641,276	489,132	—446,035	—456,093
New Jersey & New York	Mar.	45	34,235	94,819	135,260	15,254	20,682	1,292	75,455	4,281	116,964	86.50	18,296	14,918	—12,074	—10,878
	3 mos.	45	87,185	275,040	377,590	38,054	71,353	3,986	223,297	11,641	348,327	92.30	29,263	19,174	—62,918	—40,103
New York, Susquehanna & Westn.	Mar.	135	388,339	59,432	509,192	40,030	87,077	3,484	266,127	11,073	407,791	80.00	101,401	70,406	71,594	68,327
	3 mos.	135	934,234	176,933	1,269,560	140,064	231,205	10,928	760,767	35,089	1,178,053	92.80	91,507	—2,596	—3,922	79,620
Evansville, Ind. & Terre Haute	Mar.	140	121,560	7,897	136,919	37,789	8,860	2,368	60,007	2,963	111,725	81.60	25,194	20,961	—16,593	—14,721
	3 mos.	140	393,189	22,483	435,777	96,172	30,000	5,512	187,446	9,502	327,357	75.10	108,420	95,721	—17,258	—90,426
Florida East Coast	Mar.	764	1,072,343	684,508	2,013,106	175,365	218,056	17,766	514,906	30,777	972,228	48.30	1,040,878	966,069	890,142	658,155
	3 mos.	764	2,664,716	1,965,398	5,235,496	545,144	598,839	54,166	1,429,663	89,863	2,778,541	53.10	2,456,955	2,231,366	2,028,076	1,462,774
Ft. Smith & Western	Mar.	249	108,066	21,903	140,174	21,683	27,763	4,552	47,814	7,389	109,978	78.50	30,146	24,317	20,027	—1,537
	3 mos.	249	304,630	67,542	400,985	63,831	86,365	14,439	144,781	21,899	333,574	83.20	67,411	49,822	33,002	—23,618
Galveston Wharf	Mar.	13	.....	.....	111,783	34,013	3,428	460	35,336	2,948	84,413	75.50	27,370	10,312	10,833	12,691
	3 mos.	13	.....	.....	344,380	99,685	8,651	1,926	95,831	9,069	243,588	70.70	100,792	49,724	50,617	—43,483
Georgia	Mar.	328	399,387	100,338	532,995	49,946	93,912	20,040	214,015	19,134	396,856	74.56	136,139	129,572	129,528	56,689
	3 mos.	328	1,068,530	290,948	1,445,023	150,962	277,553	62,089	652,286	56,657	1,199,720	83.00	245,363	225,907	209,547	72,006

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF MARCH AND THREE MONTHS OF CALENDAR YEAR 1923—CONTINUED

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF MARCH AND THREE MONTHS OF CALENDAR YEAR 1923—CONTINUED

Name of road		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of: Way and structures.	Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rentals.	Net after rentals 1922.
Georgia and Florida	Mar.	405	$129,887	$19,778	$158,325	$20,329	$20,349	$8,838	$64,456	$7,028	$121,211	76.60	$37,114	$30,655	$17,058	$11,142
	3 mos.	405	368,547	55,029	446,852	54,661	57,742	24,935	182,397	20,785	341,160	76.40	105,692	86,552	57,097	—11,816
Grand Trunk Western	Mar.	347	1,478,654	177,241	1,735,672	80,992	300,245	27,688	710,369	49,464	1,176,735	67.80	558,937	499,046	291,323	—60,252
	3 mos.	347	3,666,386	509,615	4,427,014	252,700	916,298	87,561	1,931,857	145,246	3,355,001	75.80	1,072,013	892,329	213,429	—407,133
Atlantic & St. Lawrence	Mar.	166	288,107	34,999	342,951	37,915	74,039	3,453	247,891	7,651	372,064	108.49	—29,113	—44,263	—156,539	—16,467
	3 mos.	166	822,623	98,949	969,627	143,890	203,149	10,943	753,933	23,771	1,137,785	117.34	—168,158	—213,661	—549,732	—133,955
Chic., Del. & Can. Gr. Tr. Jt.	Mar.	59	252,199	10,080	297,355	8,655	32,389	3,258	97,839	3,458	145,589	49.00	151,766	144,144	119,921	81,633
	3 mos.	59	646,323	28,128	775,747	28,482	66,631	10,456	269,151	10,719	385,410	49.70	390,337	367,474	292,389	213,180
Det., Gr. Haven & Milwk.	Mar.	189	491,971	43,465	580,737	43,700	118,426	8,153	265,544	13,788	450,034	77.50	130,703	125,330	28,020	—5,667
	3 mos.	189	1,186,362	122,714	1,443,399	123,376	240,045	26,162	790,849	44,320	1,226,064	84.90	217,335	201,361	—21,275	—79,521
Great Northern	Mar.	8,255	7,125,406	1,209,390	9,179,935	1,024,707	2,146,304	143,768	4,278,934	206,018	7,844,757	85.50	1,335,178	646,082	882,554	847,230
	3 mos.	8,255	19,096,314	3,413,957	24,835,930	2,613,186	5,978,835	409,299	12,447,115	602,696	22,179,898	89.30	2,656,032	601,843	1,162,294	600,483
Green Bay & Western	Mar.	234	87,593	20,426	118,786	18,129	22,482	3,014	50,635	2,914	96,957	81.60	21,829	13,829	17,243	36,810
	3 mos.	234	236,126	50,351	313,988	46,761	65,771	7,597	142,348	8,919	271,179	86.30	42,809	18,809	34,845	55,795
Gulf Coast Lines	Mar.	.....	710,323	163,951	924,510	141,826	138,168	27,550	264,610	36,109	607,915	65.80	316,595	265,260	255,093	305,441
	3 mos.	.....	2,071,285	489,605	2,705,526	429,162	424,294	83,708	758,554	103,741	1,797,225	66.50	908,702	755,204	711,229	605,026
Gulf & Ship Island	Mar.	307	225,223	36,034	277,429	41,691	38,690	7,313	87,148	13,085	188,347	67.90	89,082	62,776	56,723	52,273
	3 mos.	307	613,251	107,383	764,647	118,910	108,667	23,697	238,623	40,639	532,444	69.60	232,203	157,955	140,749	91,701
Gulf, Mobile & Northern	Mar.	433	426,266	37,108	481,341	67,453	89,377	17,288	172,359	21,119	367,596	76.40	113,745	87,907	79,750	76,900
	3 mos.	433	1,228,120	107,305	1,386,483	189,658	233,105	50,945	497,713	52,177	1,022,531	73.80	363,952	291,695	239,204	161,596
Hocking Valley	Mar.	348	1,087,381	96,213	1,257,589	117,548	491,205	15,154	424,808	33,282	1,078,593	85.80	178,996	97,076	175,921	429,317
	3 mos.	348	3,232,267	269,693	3,689,422	352,209	1,415,237	38,959	1,307,032	101,957	3,211,852	87.10	477,570	232,269	408,882	836,297
Illinois Central	Mar.	4,839	11,786,863	2,179,971	14,945,775	1,861,420	3,405,819	195,109	5,821,231	321,700	11,615,733	77.70	3,330,042	2,456,881	2,316,423	2,140,567
	3 mos.	4,839	33,784,525	6,473,317	42,912,254	5,090,401	9,689,868	604,555	16,552,519	941,166	32,946,954	76.80	9,965,300	7,344,015	7,184,691	6,076,675
Yazoo & Mississippi Valley	Mar.	1,380	1,319,496	319,779	1,731,710	378,441	385,168	25,303	704,326	44,732	1,537,235	88.80	194,475	83,382	71,450	180,050
	3 mos.	1,380	3,856,282	1,008,271	5,109,339	1,056,821	1,083,113	70,319	2,042,896	130,184	4,356,017	85.30	753,322	420,325	388,776	78,446
International & Great Northern	Mar.	1,159	887,249	184,001	1,188,730	204,434	243,956	28,581	484,495	52,663	1,018,903	85.71	169,827	137,294	107,487	61,700
	3 mos.	1,159	2,578,504	543,271	3,442,007	594,140	658,336	85,501	1,426,411	149,454	2,930,038	85.13	511,969	414,433	297,663	87,852
Kans. City, Mex. & Orient	Mar.	272	122,760	7,425	141,490	43,274	28,893	4,668	70,752	5,000	152,587	107,80	—11,097	—18,327	—12,101	—24,835
	3 mos.	272	301,920	20,794	351,062	98,525	89,515	15,093	197,269	15,710	416,112	118.50	—65,050	—86,749	—68,856	—65,179
Kansas City, Mex. & O. of Tex.	Mar.	465	122,467	9,713	139,278	16,759	39,648	5,745	76,411	5,548	144,090	103.50	—4,812	—11,438	—20,890	—34,511
	3 mos.	465	327,127	26,239	372,312	60,836	99,843	16,090	221,846	17,132	415,726	111.70	—43,414	—62,279	—106,602	—158,888
Kansas City Southern	Mar.	767	1,364,868	161,467	1,642,123	208,483	353,903	39,063	600,797	79,678	1,281,794	78.10	360,329	272,064	259,935	303,218
	3 mos.	767	4,055,621	463,693	4,904,694	587,273	1,007,793	115,353	1,756,505	208,677	3,673,961	74.90	1,230,733	969,062	848,861	767,196
Texarkanna & Ft. Smith	Mar.	81	188,691	14,409	221,491	20,661	13,304	5,388	61,500	8,679	108,878	49.20	112,613	101,200	69,795	3,708
	3 mos.	81	540,276	40,222	634,085	53,048	71,064	15,806	172,279	24,888	336,404	53.10	297,681	263,108	187,152	85,087
Kansas, Oklahoma & Gulf	Mar.	314	225,412	12,075	245,803	42,082	41,976	6,762	95,271	11,085	197,266	80.30	48,537	38,589	24,329	74,445
	3 mos.	314	680,496	33,523	736,672	112,943	122,492	20,204	284,948	32,542	573,618	77.90	163,054	133,304	71,564	117,852
Lake Superior & Ishpeming	Mar.	33	9,703	104	10,719	16,540	19,253	266	13,601	2,889	52,549	490.20	—41,830	—55,583	—54,945	—39,871
	3 mos.	33	27,359	330	29,944	54,907	41,965	902	38,025	9,264	145,063	484.40	—115,119	—139,844	—134,152	—133,768
Lake Terminal	Mar.	13	.....	.....	89,804	12,796	12,935	.....	60,644	1,735	88,110	98.10	1,694	—4,557	—3,425	32,977
	3 mos.	13	.....	.....	247,622	30,233	40,392	.....	161,779	5,076	237,480	96.00	10,142	—9,810	—11,029	110,865
Lehigh & Hudson River	Mar.	96	225,394	3,468	241,227	20,348	39,501	1,394	103,163	8,388	172,794	71.60	68,433	58,433	50,143	70,681
	3 mos.	96	625,486	10,743	669,943	55,498	113,486	4,505	293,996	24,508	491,993	73.40	177,950	145,950	140,710	107,025
Lehigh & New England	Mar.	219	518,950	2,225	529,928	40,189	185,992	6,371	155,076	18,273	405,879	76.60	124,049	102,951	125,992	152,343
	3 mos.	219	1,287,067	6,632	1,316,435	109,627	460,421	24,622	451,730	50,846	1,097,170	83.30	219,265	177,179	232,205	98,764
Lehigh Valley	Mar.	1,335	5,152,451	564,722	6,196,228	563,739	2,287,442	98,143	2,733,014	128,103	5,828,985	94.10	367,243	157,402	144,309	1,228,539
	3 mos.	1,335	13,132,125	1,605,645	16,027,545	1,448,869	6,672,802	291,198	8,082,377	370,920	16,924,261	105.60	—896,716	—1,525,649	—1,738,144	2,162,488
Los Angeles & Salt Lake	Mar.	1,169	1,324,015	470,275	1,939,672	307,049	457,261	45,861	621,112	48,603	1,522,720	78.50	416,952	303,521	275,614	65,271
	3 mos.	1,164	3,495,838	1,299,980	5,213,624	836,777	1,333,292	137,055	1,869,489	146,013	4,428,269	85.10	775,355	434,878	341,874	84,083
Louisiana & Arkansas	Mar.	302	306,394	32,827	347,613	49,883	44,623	8,335	105,455	9,125	217,202	62.50	130,411	100,918	96,237	39,841
	3 mos.	302	895,257	95,468	1,012,905	140,641	125,980	23,873	301,113	26,778	617,878	61.00	395,027	309,517	291,917	69,902
Louisiana Ry. & Nav.	Mar.	343	295,699	30,248	341,809	75,386	59,147	11,457	135,559	11,219	292,721	85.60	49,088	30,737	6,531	45,000
	3 mos.	343	841,563	89,785	985,458	197,277	176,574	33,181	383,369	34,195	824,148	83.60	161,310	108,528	42,447	23,422
Louisville & Nashville	Mar.	5,038	9,025,942	1,864,404	11,608,410	1,382,315	3,002,831	239,989	4,299,222	245,052	9,222,857	79.40	2,385,553	1,949,171	2,073,023	1,502,512
	3 mos.	5,038	24,821,256	5,756,676	32,423,027	4,003,042	8,321,868	721,098	12,580,243	694,572	26,449,166	81.60	5,973,861	4,635,810	4,939,742	2,838,476
Louisville, Hender. & St. Louis	Mar.	199	215,471	58,903	294,365	59,395	37,328	6,378	94,835	8,954	206,890	70.30	87,475	71,754	53,924	43,380
	3 mos.	199	618,768	170,445	833,948	155,948	109,369	18,741	282,958	25,878	592,894	71.10	241,054	193,896	150,059	66,802
Maine Central	Mar.	1,201	1,304,813	375,970	1,819,443	273,091	329,367	14,999	941,376	52,314	1,611,338	88.50	208,105	109,539	59,701	225,398
	3 mos.	1,201	3,333,991	1,033,607	4,742,841	871,207	941,634	38,566	2,733,938	144,905	4,730,363	99.70	12 478	—283,521	—358,327	329,009
Midland Valley	Mar.	365	314,026	63,644	392,577	49,042	58,979	4,902	123,722	16,928	253,427	64.60	139,150	123,672	115,806	136,235
	3 mos.	365	895,450	181,693	1,124,791	133,530	167,441	15,289	365,991	47,502	729,038	64.80	395,753	349,638	318,711	308,212
Minneapolis & St. Louis	Mar.	1,649	1,249,129	176,069	1,491,408	182,058	365,448	23,891	674,224	44,842	1,290,516	86.50	200,892	135,276	91,373	115,683
	3 mos.	1,649	3,598,484	472,139	4,260,937	501,352	928,013	72,692	1,954,792	134,342	3,590,475	84.30	670,462	470,469	369,768	333,735
Minn., St. Paul & S. S. Marie	Mar.	4,380	2,931,118	593,330	3,814,695	480,414	841,618	55,531	1,922,698	103,676	3,419,141	89.60	395,554	126,102	118,736	242,857
	3 mos.	4,380	8,677,867	1,754,132	11,207,632	1,367,662	2,119,658	160,420	5,617,523	340,722	9,619,127	85.80	1,588,505	810,828	880,134	—553,107
Mississippi Central	Mar.	257	138,158	15,012	158,752	20,377	26,093	5,331	53,237	6,920	111,958	70.50	46,794	41,793	43,494	25,889
	3 mos.	257	410,255	42,973	469,293	56,874	66,045	16,631	156,456	20,568	316,574	67.50	152,719	135,632	134,290	33,537

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF MARCH AND THREE MONTHS OF CALENDAR YEAR 1923—CONTINUED

Name of road		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rentals.	Net after rentals 1922.
Missouri & North Ark.	Mar.	364	$104,553	$20,341	$134,104	$19,163	$15,015	$3,150	$70,352	$7,333	$115,013	85.80	$19,091	$14,886	$6,810	.....
	3 mos.	364	272,884	56,747	350,896	56,968	48,708	8,456	171,866	18,018	304,616	86.60	46,880	34,524	—6,828	.....
Missouri, Kansas & Texas	Mar.	1,670	2,203,375	443,580	2,916,201	172,621	937,765	57,620	887,202	100,478	2,159,760	74.10	756,441	622,641	769,039	$882,475
	3 mos.	1,670	6,141,728	1,366,148	8,227,312	595,334	2,680,499	160,460	2,649,048	343,726	6,451,921	78.40	1,775,391	1,362,633	1,701,789	1,849,307
Mo., Kans. & Tex. of Tex.	Mar.	1,738	1,032,266	398,305	1,618,419	211,681	406,515	37,004	756,903	70,045	1,472,734	91.00	145,685	87,066	—114,998	274,026
	3 mos.	1,738	3,209,906	1,169,733	4,857,258	614,444	1,167,871	125,728	2,236,742	279,975	4,420,519	91.00	436,739	263,523	—395,815	390,259
Wichita Falls & Northw.	Mar.	329	53,228	16,645	77,991	3,085	21,401	559	42,774	15,704	82,928	106.30	—4,937	—16,307	—24,731	—26,032
	3 mos.	329	194,994	47,000	260,856	43,361	61,835	3,179	130,174	45,904	281,946	108.10	—21,090	—54,993	—87,780	—57,228
Missouri Pacific	Mar.	7,171	6,957,870	1,441,490	9,233,402	1,301,041	2,517,759	148,352	3,810,114	280,634	8,091,517	87.60	1,141,885	760,452	418,903	781,439
	3 mos.	7,171	19,114,085	4,294,221	25,606,872	3,287,597	6,630,572	450,318	11,049,221	789,335	22,292,788	87.10	3,314,084	2,170,860	1,016,691	1,543,045
Mobile & Ohio	Mar.	1,165	1,624,711	150,757	1,874,310	219,066	420,040	45,400	671,019	47,747	1,402,733	74.80	471,577	368,896	339,456	227,320
	3 mos.	1,165	4,645,418	461,103	5,379,860	603,543	1,271,931	137,961	1,924,165	138,961	4,076,643	75.80	1,303,217	1,030,441	915,912	505,850
Monongahela	Mar.	106	404,398	42,223	452,843	60,016	97,515	1,304	149,135	8,583	316,553	69.90	136,290	126,340	67,388	265,592
	3 mos.	106	1,106,881	118,689	1,240,625	138,248	292,487	3,909	427,673	26,364	888,681	71.60	351,944	322,094	134,684	558,582
Monongahela Connecting	Mar.	7	.....	.....	229,385	30,438	41,984	582	119,216	4,857	197,077	85.90	32,308	29,652	10,067	50,892
	3 mos.	7	.....	.....	626,123	68,448	112,009	1,734	356,505	14,250	552,946	88.30	73,177	67,105	7,749	94,963
Mentour	Mar.	57	180,563	625	182,841	27,008	44,773	1,054	43,302	6,916	123,053	67.30	59,788	48,819	72,120	25,821
	3 mos.	57	436,143	1,572	443,632	58,764	133,143	3,279	113,624	20,726	329,536	74.30	114,096	87,389	179,380	45,050
Nash., Chatt. & St. Louis	Mar.	1,258	1,643,459	384,357	2,184,247	311,389	460,497	84,678	836,695	61,231	1,761,298	80.60	422,949	362,098	396,694	69,194
	3 mos.	1,258	4,358,539	1,190,755	5,933,388	792,571	1,330,500	227,579	2,424,916	183,782	4,980,195	83.90	953,193	771,587	905,607	150,829
Nevada Northern	Mar.	165	58,105	8,251	74,016	11,703	6,044	434	14,868	3,199	36,248	48.90	37,768	31,171	32,494	—1,786
	3 mos.	165	147,555	21,505	183,142	34,478	15,097	1,296	39,211	9,595	99,677	54.40	83,465	63,666	69,083	—17,123
Newburg & South Shore	Mar.	7	.....	.....	180,303	12,699	49,201	.....	79,147	4,024	145,071	80.50	35,232	22,374	11,784	61,249
	3 mos.	7	.....	.....	502,146	33,088	147,725	.....	240,251	12,584	433,648	86.30	68,498	30,824	2,040	110,301
New Orleans Gr. Northern	Mar.	274	205,476	30,070	243,484	27,003	32,195	6,655	69,968	11,093	146,614	60.20	96,870	80,247	80,763	40,764
	3 mos.	274	580,723	86,057	691,734	80,117	99,858	17,336	212,891	31,783	443,219	64.10	248,515	198,147	198,059	14,060
New York Central	Mar.	6,899	25,599,124	7,210,500	36,898,954	3,605,900	8,872,166	355,704	13,974,016	855,228	28,041,426	76.00	8,857,528	6,759,111	6,695,535	4,850,162
	3 mos.	6,895	67,685,195	21,614,491	100,648,229	9,717,929	25,590,760	963,103	40,487,922	2,437,344	80,343,085	79.80	20,305,144	14,807,323	14,334,233	12,120,930
Cincinnati Northern	Mar.	244	466,339	15,274	489,229	60,652	74,768	4,712	164,181	7,372	311,685	63.70	177,544	149,165	110,087	100,632
	3 mos.	244	1,272,956	42,132	1,336,030	163,682	232,299	13,438	475,506	22,054	906,824	67.90	429,206	355,600	248,814	199,335
Cleve., Cin., Chic. & St. Louis	Mar.	2,407	6,250,925	1,362,671	8,298,896	734,359	2,082,616	113,697	3,104,415	186,884	6,272,420	75.60	2,026,476	1,594,003	1,546,239	1,976,056
	3 mos.	2,408	17,962,789	3,935,114	23,765,866	2,065,480	5,784,899	306,195	9,232,181	537,587	18,075,761	76.10	5,690,105	4,432,291	4,178,236	3,510,066
Indiana Harbor Belt	Mar.	119	.....	.....	1,056,041	77,487	119,136	5,086	527,956	21,510	751,175	71.10	304,866	293,761	149,876	275,451
	3 mos.	120	.....	.....	2,898,987	267,416	395,264	14,457	1,427,101	63,767	2,168,005	74.80	730,982	672,765	289,732	513,116
Michigan Central	Mar.	1,862	6,250,095	1,453,188	8,568,157	766,488	1,797,128	103,443	2,961,911	148,316	5,847,200	68.20	2,720,957	2,250,844	1,954,501	1,259,285
	3 mos.	1,862	16,570,083	4,355,609	23,190,528	2,140,888	4,636,439	278,613	8,485,301	424,942	16,179,187	69.80	7,011,341	5,718,804	4,997,912	2,578,289
Pittsburgh & Lake Erie	Mar.	231	3,608,262	258,387	3,758,899	348,925	1,009,716	19,326	1,137,345	63,206	2,580,264	68.60	1,178,635	975,194	1,354,425	263,896
	3 mos.	231	9,760,415	751,056	10,620,696	959,661	2,866,454	58,808	3,268,405	188,405	7,347,303	69.20	3,273,393	2,646,261	3,800,584	—237,225
New York, Chic. & St. Louis	Mar.	1,242	3,689,040	124,398	3,966,971	359,108	730,224	84,849	1,567,186	117,346	2,865,461	72.20	1,101,510	911,622	799,607	827,084
	3 mos.	1,242	9,920,995	371,938	10,706,135	1,007,594	2,415,151	254,797	4,410,819	360,317	8,968,928	79.10	2,237,207	1,667,322	1,395,971	1,748,915
New York, New Haven & Hart.	Mar.	2,000	5,864,465	4,008,216	11,288,630	1,022,172	2,554,723	51,906	4,986,793	287,479	9,060,734	80.30	2,227,896	1,817,200	794,871	1,775,085
	3 mos.	2,000	14,965,925	11,671,035	30,478,679	3,059,973	7,700,652	167,165	14,315,605	843,723	26,604,777	87.30	3,873,902	2,610,282	—315,409	3,573,858
Central New England	Mar.	295	533,344	19,317	587,282	103,602	141,306	5,845	255,802	13,934	520,489	88.60	66,793	42,690	—14,206	211,612
	3 mos.	295	1,469,968	54,125	1,619,907	257,471	403,175	14,892	779,880	35,523	1,490,941	92.00	128,966	57,354	—218,260	495,966
New York, Ontario & Western	Mar.	569	836,233	138,742	1,133,505	102,297	250,000	14,799	616,545	31,938	1,017,382	89.80	116,123	73,500	36,069	188,426
	3 mos.	569	2,122,386	370,862	2,941,473	335,908	750,000	44,827	1,822,184	97,450	3,054,106	103.80	—112,633	—240,494	—380,744	171,104
Norfolk & Western	Mar.	2,237	6,655,071	761,876	7,772,801	927,203	1,956,268	78,576	2,743,487	158,398	5,886,819	75.70	1,885,982	1,410,196	1,820,092	1,933,795
	3 mos.	2,237	18,113,909	2,233,580	21,267,275	2,755,794	5,934,942	247,082	7,955,576	447,062	17,398,077	81.80	3,869,198	2,433,447	3,489,865	4,442,947
Norfolk Southern	Mar.	930	759,860	108,395	914,108	101,711	128,535	23,889	358,940	29,926	643,492	70.40	270,616	232,282	168,535	135,858
	3 mos.	930	1,860,816	320,605	2,294,396	291,313	349,402	69,362	974,532	86,942	1,773,070	77.30	521,326	406,046	277,490	132,527
Northern Pacific	Mar.	6,665	6,307,365	1,201,319	8,201,602	854,798	2,179,085	158,205	3,434,116	232,483	6,941,882	84.60	1,259,720	552,728	1,113,614	1,160,077
	3 mos.	6,665	17,166,169	3,492,171	22,624,515	2,264,916	6,107,841	446,933	10,273,671	645,827	20,056,860	88.70	2,567,655	474,314	2,103,190	338,802
Northwestern Pacific	Mar.	496	354,010	191,839	602,479	127,209	110,765	7,932	234,307	18,225	500,267	83.00	102,212	53,012	42,446	77,776
	3 mos.	496	981,897	509,218	1,645,983	381,056	302,901	16,222	681,937	55,482	1,442,894	87.70	203,089	55,716	22,168	70,572
Pennsylvania	Mar.	10,534	42,775,149	12,065,513	60,331,996	4,961,331	15,958,607	630,666	24,326,760	1,456,728	48,162,775	79.80	12,169,221	9,879,477	8,774,189	11,582,039
	3 mos.	10,534	114,075,241	35,892,686	165,457,739	14,035,518	45,942,308	1,864,243	71,170,455	4,277,198	139,729,306	84.50	25,728,433	20,212,349	17,008,250	23,309,241
Balt., Chesa. & Atlantic	Mar.	87	82,005	24,007	111,332	13,907	55,172	1,948	76,268	4,882	152,177	136.70	—40,845	—43,870	—46,311	—15,935
	3 mos.	87	193,372	64,290	270,320	29,821	101,782	4,530	218,524	11,795	366,452	135.60	—96,132	—96,170	—98,009	—64,113
Long Island	Mar.	397	919,756	1,323,028	2,490,352	289,662	512,916	14,962	1,230,833	65,701	2,129,569	85.50	360,783	300,172	202,837	221,319
	3 mos.	397	2,489,400	3,755,718	6,894,479	793,386	1,461,815	46,747	3,613,429	186,328	6,149,112	89.20	745,367	615,605	316,442	412,208

REVENUES AND EXPENSES OF RAILWAYS

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF MARCH AND THREE MONTHS OF CALENDAR YEAR 1923—CONTINUED

Name of road		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Maintenance of: Way and structures.	Equipment.	Operating expenses: Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rentals.	Net after rentals 1922.
Md., Dela. & Va.	Mar.	82	$57,991	$17,581	$79,248	$8,670	$20,305	$2,048	$58,664	$2,755	$92,442	116.60	—$13,194	—$14,694	—$14,083	—$21,358
	3 mos.	82	138,719	44,617	192,925	21,960	78,068	3,460	173,559	7,047	284,094	147.30	—91,169	—91,170	—93,745	—69,427
West Jersey & Seashore	Mar.	359	455,155	497,091	1,042,262	177,357	204,599	12,068	505,988	25,531	938,122	90.00	104,140	87,974	70,890	84,312
	3 mos.	359	1,237,767	1,354,918	2,833,508	492,313	577,481	35,163	1,495,190	74,686	2,714,088	95.80	119,420	119,305	58,767	—75,137
Peoria & Pekin Union	Mar.	19	20,416	3,241	153,124	15,286	20,503	555	67,696	11,378	115,418	75.40	37,706	25,206	47,155	68,174
	3 mos.	19	63,098	9,086	452,170	36,282	51,858	1,313	199,630	29,531	318,614	70.50	133,556	96,056	174,782	196,440
Pere Marquette	Mar.	2,212	3,073,749	418,598	3,838,932	307,056	855,759	50,252	1,501,421	109,535	2,830,034	73.70	1,008,898	872,159	664,405	595,812
	3 mos.	2,212	8,223,622	1,154,755	10,348,036	781,242	2,416,278	149,292	4,297,236	321,236	7,987,635	77.20	2,360,401	1,957,639	1,379,499	1,143,999
Philadelphia & Reading	Mar.	1,124	8,054,617	853,663	9,437,962	592,703	1,871,416	98,418	3,339,164	147,962	6,068,877	64.30	3,369,085	3,104,647	2,934,006	2,464,970
	3 mos.	1,124	22,982,009	2,521,619	26,866,527	1,874,915	5,588,593	229,557	10,203,369	435,442	18,392,441	68.50	8,474,086	7,682,881	6,927,898	4,475,027
Atlantic City	Mar.	176	151,430	158,312	323,165	51,403	34,392	6,619	186,934	4,370	283,430	87.70	39,735	20,147	—20,416	—55,620
	3 mos.	176	368,622	385,998	791,894	166,826	98,569	15,399	570,941	13,018	864,427	109.20	—72,533	—131,281	—217,675	—132,630
Perkiomen	Mar.	41	71,382	6,635	82,238	6,905	3,883	112	39,444	794	51,168	62.20	31,070	24,937	20,535	22,058
	3 mos.	41	240,132	18,510	270,542	17,165	10,899	326	116,379	2,395	147,252	54.40	123,290	104,891	93,422	61,625
Port Reading	Mar.	21	213,529	.....	271,753	14,208	10,991	229	96,631	3,003	125,062	46.00	146,691	132,537	63,388	123,471
	3 mos.	21	678,988	.....	851,636	40,336	28,371	687	321,042	8,198	398,631	46.80	453,005	411,703	172,908	190,678
Pittsburgh & Shawmut	Mar.	102	151,083	7,734	160,295	23,010	54,657	1,990	57,537	6,270	143,464	89.50	16,831	16,675	48,845	47,115
	3 mos.	102	405,428	19,110	431,070	62,699	146,324	5,516	164,665	18,982	398,186	92.40	32,884	32,435	134,851	100,883
Pittsburgh & West Virginia	Mar.	89	279,008	9,973	319,894	32,087	89,400	3,260	82,586	13,234	231,227	72.30	88,667	46,146	137,246	91,056
	3 mos.	89	710,363	26,046	829,622	76,074	244,132	9,508	235,717	38,515	634,961	76.50	194,661	75,698	331,673	232,374
Pittsburgh, Shaw. & Northern	Mar.	210	122,845	9,337	136,014	20,985	48,010	1,441	57,554	1,395	129,385	95.10	6,629	4,229	28,418	—6,515
	3 mos.	210	394,387	26,781	429,989	65,539	135,823	5,446	184,596	17,808	409,219	95.20	20,770	13,498	76,897	—27,599
Quincy, Omaha & Kansas City	Mar.	250	108,186	24,338	141,157	33,880	25,320	608	71,395	2,239	133,360	94.50	7,797	4,123	—3,648	—298
	3 mos.	250	269,206	63,516	355,188	77,987	68,203	2,568	209,618	6,679	364,208	102.50	—9,020	—20,047	—42,574	—54,486
Richmond, Fred. & Potomac	Mar.	117	525,960	417,789	1,154,636	97,540	141,979	8,204	396,195	29,700	699,007	60.50	455,629	388,573	316,017	219,474
	3 mos.	117	1,327,724	1,137,741	2,995,323	236,690	408,983	27,371	1,147,892	87,550	1,977,914	66.00	1,017,409	858,943	661,442	460,784
Rutland	Mar.	413	388,937	131,575	621,240	80,894	106,119	9,921	278,804	13,637	490,997	79.00	130,243	105,270	124,604	52,918
	3 mos.	413	942,310	364,663	1,577,322	240,576	299,191	24,836	785,491	38,253	1,392,739	88.30	184,583	124,121	188,995	39,710
Ft. Worth & Rio Grande	Mar.	235	67,199	27,156	105,393	25,121	27,139	2,795	56,426	5,674	116,969	111.00	—11,576	—15,357	—20,883	—36,222
	3 mos.	235	212,047	76,913	315,591	64,622	75,646	8,775	168,578	17,706	326,977	103.60	—11,386	—22,727	—48,855	—94,999
St. Louis, San Fran. & Tex.	Mar.	134	95,622	12,314	114,495	24,199	25,211	3,559	54,264	8,266	115,166	100.60	—671	—3,055	—21,136	—27,196
	3 mos.	134	295,155	42,251	355,908	73,898	64,117	11,249	162,975	23,318	335,222	94.20	20,686	14,167	—49,328	—49,125
St. Louis-Southwestern	Mar.	968	1,681,610	151,745	1,939,911	198,236	373,603	42,404	523,610	54,217	1,199,597	61.80	740,314	649,689	563,449	442,295
	3 mos.	968	4,889,073	440,859	5,556,461	579,645	1,087,142	130,765	1,499,086	162,687	3,480,285	62.60	2,076,176	1,844,175	1,570,417	1,083,579
St. Louis-Southw. of Tex.	Mar.	807	495,585	92,673	627,752	146,646	263,325	19,432	357,750	32,198	809,076	28.90	—181,324	—210,930	—180,913	—214,533
	3 mos.	807	1,516,474	272,707	1,901,875	412,371	786,346	59,595	1,086,180	95,025	2,430,060	127.80	—528,185	—608,018	—573,822	—427,526
San Antonio & Aransas Pass	Mar.	739	308,829	62,186	399,052	124,141	126,524	9,929	183,105	22,551	464,777	116.50	—65,725	—81,151	—69,414	—97,664
	3 mos.	739	905,592	182,110	1,172,313	314,039	372,254	33,977	550,014	74,611	1,341,305	114.40	—168,992	—216,218	—166,178	—238,190
San Ant., Uvalde & Gulf	Mar.	317	55,944	20,012	87,045	16,175	13,976	3,355	40,811	6,854	81,162	93.20	5,883	2,804	—10,400	2,151
	3 mos.	317	164,217	54,079	244,309	42,675	39,800	10,726	108,593	20,558	222,098	90.90	22,211	12,708	—27,757	—15,736
Seaboard Air Line	Mar.	3,574	3,567,812	861,647	4,886,727	573,697	866,592	170,368	2,023,520	172,269	3,859,454	79.00	1,027,273	851,855	561,967	434,159
	3 mos.	3,575	9,762,319	2,933,231	13,916,934	1,627,150	2,475,183	453,514	5,703,369	496,813	10,892,710	78.30	3,024,224	2,496,709	1,644,426	690,109
Southern	Mar.	6,971	9,707,911	2,549,935	13,186,303	1,715,818	2,374,503	226,420	4,999,839	326,825	9,725,359	73.70	3,460,944	2,836,097	2,616,046	1,829,583
	3 mos.	6,971	26,255,247	7,514,759	36,355,683	4,959,905	6,716,882	548,503	14,134,122	936,025	27,652,364	76.10	8,703,319	7,170,879	6,494,186	3,270,634
Ala. Gt. Southern	Mar	318	748,970	144,777	942,537	104,576	149,052	19,783	300,799	24,076	603,638	64.00	338,899	278,547	292,442	235,720
	3 mos.	318	2,075,906	436,658	2,653,251	294,115	460,125	61,547	920,564	75,549	1,827,983	68.90	825,268	665,599	697,074	389,848
Cin., N. O. & Texas Pacific	Mar.	338	1,683,930	318,452	2,087,368	218,090	434,151	36,528	614,442	40,263	1,354,551	64.90	732,817	615,169	519,179	339,889
	3 mos.	338	4,459,224	1,001,893	5,703,311	617,957	1,244,664	101,904	1,785,396	132,736	3,913,751	68.60	1,789,560	1,495,263	1,355,888	771,010
Ga., Southern & Fla.	Mar.	402	304,805	118,872	463,974	67,401	76,282	9,155	194,350	10,582	361,337	77.90	102,637	83,118	68,944	11,490
	3 mos.	402	822,371	357,308	1,291,139	194,668	203,968	25,543	532,004	34,748	1,001,244	77.50	289,895	228,028	134,977	57,554
New O. & Northwestern	Mar.	207	467,824	76,545	606,581	81,037	107,430	10,366	225,682	15,476	443,368	73.10	163,213	105,979	115,161	64,605
	3 mos.	207	1,346,725	223,826	1,752,732	236,885	318,720	32,901	654,450	48,770	1,301,882	74.30	450,850	294,875	272,041	71,649
Northern Alabama	Mar.	110	119,360	13,347	135,755	25,174	6,070	2,090	50,185	3,515	87,034	64.10	48,721	41,751	29,583	19,091
	3 mos.	110	357,849	37,551	403,458	69,311	21,945	5,650	142,538	9,886	249,330	61.80	154,128	139,201	84,788	30,186
Southern Pacific	Mar.	7,116	10,739,304	3,823,571	16,143,649	2,242,087	2,916,780	275,104	5,071,764	448,661	11,225,016	69.50	4,918,633	3,636,914	3,578,508	2,310,567
	3 mos.	7,116	28,644,891	10,586,227	43,619,618	6,442,356	8,378,146	843,240	14,624,622	1,343,430	32,416,627	74.30	11,202,991	7,351,958	7,139,644	3,917,882
Arizona Eastern	Mar.	382	292,463	30,606	340,932	35,730	53,077	3,244	93,890	19,384	206,530	60.60	134,402	104,997	90,778	47,356
	3 mos.	382	777,655	93,132	919,599	118,193	138,416	8,300	224,269	56,197	548,884	59.70	370,715	287,845	253,191	84,999
Atlantic S. S. Lines	**Mar.**	...	**1,073,693**	**54,294**	**1,181,936**	**14,808**	**166,253**	**18,857**	**719,929**	**31,277**	**951,124**	**80.50**	**230,812**	**219,050**	**219,050**	**231,288**
	3 mos.	...	**3,053,127**	**167,109**	**3,383,599**	**41,346**	**503,718**	**63,139**	**2,040,819**	**84,507**	**2,733,529**	**80.80**	**650,070**	**615,146**	**614,756**	**606,790**

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF MARCH AND THREE MONTHS OF CALENDAR YEAR 1923—CONTINUED

Name of road		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of: Way and structures.	Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rentals.	Net after rentals 1922.
Galv., Harris. & San Ant.	Mar.	1,379	$1,351,295	$404,292	$1,863,123	$389,146	$375,455	$42,935	$746,181	$69,311	$1,609,759	86.40	$253,364	$192,258	$133,151	$196,691
	3 mos.	1,379	3,916,281	1,211,825	5,431,438	1,154,906	1,174,368	132,723	2,152,998	214,367	4,806,142	88.50	625,296	440,991	306,168	421,014
Houston & Tex. Central	Mar.	923	741,495	247,596	1,072,968	241,889	254,819	24,925	423,570	46,463	990,953	92.40	82,015	27,728	—18,711	183,869
	3 mos.	923	2,309,137	741,162	3,276,162	728,163	738,015	77,171	1,238,572	137,226	2,913,203	88.90	362,959	200,824	92,706	589,172
Houston E. & W. Texas	Mar.	191	206,174	43,465	265,536	57,959	58,041	3,442	102,744	8,620	230,295	86.70	35,241	26,816	12,313	17,727
	3 mos.	191	540,998	121,996	703,352	176,049	173,111	10,197	282,201	25,690	663,967	94.40	39,385	13,486	—28,572	—26,614
Louisiana Western	Mar.	207	296,262	82,504	406,239	65,323	74,756	9,488	131,918	17,654	302,964	74.60	103,275	76,411	74,732	95,465
	3 mos.	207	829,758	257,482	1,165,742	195,684	217,182	28,397	332,916	51,117	836,937	71.80	328,805	248,211	236,576	212,038
Morgan's La. & T. R. R. & S. S.	Mar.	400	537,467	144,760	742,168	169,325	160,653	16,346	281,965	31,382	649,539	87.50	92,629	45,604	24,539	17,709
	3 mos.	400	1,688,864	463,458	2,328,037	509,406	471,661	48,550	893,665	93,893	2,016,512	86.60	311,525	170,306	80,342	—84,017
Texas & New Orleans	Mar.	507	568,823	155,233	773,976	197,021	161,673	13,687	280,806	26,014	684,392	88.40	89,584	60,990	48,730	18,684
	3 mos.	507	1,549,226	454,607	2,152,369	584,074	512,890	41,381	832,907	76,599	2,053,083	95.40	99,286	13,228	—58,616	186,218
Spokane International	Mar.	165	101,152	18,559	125,322	12,837	10,739	3,510	40,225	5,877	73,920	59.00	51,402	45,567	38,357	23,931
	3 mos.	165	254,074	47,716	317,659	33,400	30,526	9,915	122,369	17,409	216,031	68.00	101,628	84,227	63,320	42,768
Spokane, Portland & Seattle	Mar.	551	478,566	121,596	665,995	69,273	104,406	9,395	222,207	19,290	439,812	66.00	226,183	151,082	155,719	101,459
	3 mos.	551	1,278,044	362,251	1,820,839	178,671	322,609	27,640	588,302	53,450	1,210,451	66.50	610,388	384,972	356,685	233,979
Tennessee Central	Mar.	287	210,796	40,732	264,728	42,196	41,419	5,620	101,245	9,786	200,248	75.60	64,480	58,827	38,521	24,941
	3 mos.	287	584,529	116,550	739,576	102,050	121,269	17,114	295,021	28,513	563,573	76.20	176,003	160,281	94,491	16,037
Term. R. R. Assn. of St. Louis	Mar.	37	.....	.....	431,667	78,749	42,429	991	149,319	7,508	282,192	65.40	149,475	87,755	224,931	205,749
	3 mos.	37	.....	.....	1,198,779	241,459	130,768	2,965	428,494	16,867	830,382	69.20	368,397	175,889	544,786	602,319
E. St. Louis Connecting	Mar.	1	.....	.....	211,346	11,785	7,882	284	66,064	2,258	88,243	41.80	123,103	112,533	92,072	161,148
	3 mos.	1	.....	.....	619,759	40,826	25,908	845	201,265	7,349	276,193	44.60	343,566	311,838	255,801	236,210
St. Louis, Merchants' Br. Term.	Mar.	9	.....	.....	448,743	41,350	32,574	916	207,348	6,822	289,010	64.40	159,733	132,956	124,474	137,334
	3 mos.	9	.....	.....	1,313,314	152,642	107,343	2,712	611,099	19,146	892,942	68.00	420,372	339,985	318,462	332,549
St. Louis Transfer	Mar.	6	.....	.....	74,787	4,070	5,371	165	39,345	1,201	50,152	67.10	24,635	24,367	17,220	—75,569
	3 mos.	6	.....	.....	223,075	13,179	15,801	491	118,278	3,718	151,467	67.90	71,608	70,794	50,156	19,411
Texas & Pacific	Mar.	1,952	1,864,503	579,804	2,657,673	412,071	754,601	48,374	1,031,660	85,351	2,342,916	88.20	314,757	212,706	91,877	145,187
	3 mos.	1,952	5,442,548	1,714,329	7,737,629	1,026,488	2,289,815	149,175	3,078,759	294,346	6,893,454	89.10	844,175	537,888	58,171	403,644
Toledo, Peoria & Western	Mar.	247	96,312	50,646	163,427	25,157	52,402	2,646	79,143	7,799	167,147	102.30	—3,720	—14,720	—7,595	—23,002
	3 mos.	247	293,553	139,860	471,308	75,386	144,318	7,579	246,130	22,496	495,841	105.20	—24,533	—57,616	—40,463	—62,822
Toledo, St. Louis & West	Mar.	454	1,149,988	30,920	1,230,430	126,797	135,458	20,356	353,184	17,704	653,499	53.10	576,931	490,032	416,984	161,083
	3 mos.	454	3,072,593	85,706	3,292,732	350,343	430,638	62,700	1,026,355	57,469	1,927,505	58.50	1,365,227	1,145,335	958,610	478,906
Trinity & Brazos Valley	Mar.	368	102,401	16,895	125,743	20,232	29,027	2,864	61,612	11,434	123,816	98.50	1,927	—5,667	—22,754	—14,102
	3 mos.	368	349,686	49,955	419,696	95,701	92,502	10,684	199,346	33,579	429,290	102.30	—9,594	—32,282	—93,132	—39,720
Ulster & Delaware	Mar.	128	67,360	22,138	129,819	16,873	23,241	1,569	59,276	7,870	108,829	83.80	20,990	14,976	10,952	11,712
	3 mos.	128	162,440	65,036	333,952	48,006	72,154	4,987	171,629	23,655	321,374	96.20	12,578	—5,442	—15,614	—35,868
Union	Mar.	45	.....	.....	898,809	69,022	195,280	183	474,884	7,094	746,463	83.00	152,346	141,346	245,629	167,913
	3 mos.	45	.....	.....	2,614,884	152,012	546,992	510	1,407,864	22,333	2,129,655	81.40	485,229	452,229	692,427	508,172
Union Pacific	Mar.	3,708	6,712,406	1,339,881	8,828,009	884,406	1,921,658	121,227	2,593,846	274,146	5,943,384	67.30	2,884,625	2,319,352	2,413,927	2,183,740
	3 mos.	3,708	18,707,722	3,691,441	24,562,798	2,103,370	5,819,526	364,531	7,694,234	803,113	17,239,243	70.20	7,323,555	5,631,018	5,849,256	4,803,690
Oreg. Short Line	Mar.	2,366	2,403,142	410,684	3,041,930	485,376	629,137	39,765	964,229	109,162	2,278,960	74.90	762,970	511,200	520,169	770,836
	3 mos.	2,366	6,985,873	1,149,660	8,749,027	1,110,632	1,902,756	123,364	2,983,602	312,779	6,583,512	75.20	2,165,515	1,408,340	1,398,083	1,520,105
Oreg.-Wash. R. R. & Nav.	Mar.	2,238	1,650,453	441,267	2,299,850	464,662	448,697	57,712	1,012,932	121,168	2,128,305	92.50	171,545	4,641	—51,115	—48,233
	3 mos.	2,237	4,785,118	1,243,193	6,613,706	1,142,199	1,373,715	171,481	3,214,876	356,827	6,320,488	95.60	293,218	—206,898	—399,637	—267,544
St. Joseph & Grand Isl.	Mar.	258	245,530	26,256	286,346	34,205	52,176	2,723	147,141	12,948	248,804	86.90	37,542	24,395	11,884	39,377
	3 mos.	258	676,680	70,804	792,044	88,834	153,757	7,492	392,221	36,282	680,192	85.90	111,852	72,313	33,282	65,969
Utah	Mar.	102	118,734	661	120,426	14,137	36,071	345	33,099	5,629	89,281	74.10	31,145	21,289	14,909	34,403
	3 mos.	102	393,152	2,169	398,374	43,705	119,599	1,059	111,473	15,980	292,026	73.30	106,348	82,205	64,217	77,021
Virginian	Mar.	540	1,899,038	75,231	2,087,197	178,705	387,203	11,542	529,459	33,702	1,143,214	54.80	943,983	844,623	886,124	722,923
	3 mos.	540	4,701,292	210,064	5,207,344	514,022	1,142,814	34,103	1,465,447	101,626	3,265,491	62.70	1,941,853	1,626,359	1,766,742	1,696,422
Wabash	Mar.	2,472	4,439,830	694,730	5,501,278	656,389	1,124,237	124,256	2,136,916	155,102	4,216,463	76.60	1,284,815	1,093,853	819,196	690,505
	3 mos.	2,472	11,947,680	1,956,501	14,983,010	1,841,793	3,256,637	347,260	6,167,734	446,604	12,116,719	80.90	2,866,291	2,294,512	1,458,436	1,161,796
Western Maryland	Mar.	804	1,832,642	75,360	2,011,685	201,425	560,024	35,373	726,641	45,096	1,588,415	79.00	423,270	353,270	402,526	254,381
	3 mos.	804	4,924,180	214,288	5,447,724	553,645	1,436,138	103,581	2,041,792	131,508	4,327,869	79.40	1,119,855	919,855	1,057,613	786,953
Western Pacific	Mar.	1,043	673,630	166,046	909,870	141,857	189,891	29,399	333,506	33,228	742,418	81.60	167,452	91,564	150,872	—13,048
	3 mos.	1,043	2,015,128	366,947	2,567,542	390,941	579,908	96,042	1,050,689	100,842	2,249,424	87.60	318,118	90,313	301,832	—5,202
Wheeling & Lake Erie	Mar.	511	1,167,627	62,587	1,330,759	132,271	403,159	14,897	462,144	31,884	1,047,766	78.70	282,993	182,171	163,657	230,231
	3 mos.	511	3,004,575	175,386	3,458,619	315,192	1,193,901	42,927	1,326,955	98,612	2,986,341	86.30	472,278	174,854	95,441	432,066
Combined report Illinois Central and Yazoo & Miss. Valley	Mar.	6,219	13,106,359	2,499,750	16,677,485	2,239,861	3,790,987	220,412	6,525,557	366,432	13,152,968	78.90	3,524,517	2,540,263	2,387,873	2,320,617
	3 mos.	6,219	37,640,807	7,481,588	48,021,593	6,147,222	10,772,981	674,874	18,595,415	1,071,350	37,302,971	77.70	10,718,622	7,764,340	7,573,467	6,155,116

Traffic News

The Grand Trunk has withdrawn from the Consolidated Ticket Office at Buffalo, N. Y., and has opened an office in the Ellicot Square building, 11 South Division street.

A record for a single consignment of washing machines was made when a solid trainload of 3,000 machines, valued at $400,000 and shipped from Newton, Iowa, was turned over to the Pennsylvania at Chicago for movement to Pittsburgh, Pa., and points east of there.

The Canadian National will add an express train to its Montreal-Toronto service on May 13. The train will leave Montreal at 9:30 p. m., Eastern Standard time, and will arrive at Toronto at 6:20 a. m. Returning, the train will leave Toronto at 9:45 p. m. and arrive at Montreal at 6:45 a. m.

A request for an early hearing in San Francisco on the repeal of the Pullman surcharge, has been sent by the Railroad Commission of California to the Interstate Commerce Commission. This action is the result of the state hearing on the surcharge in July, 1922, on which the California commission is now ready to act. Attention was called in the request to the number of surcharge items paid for within the state of California during 1922, which totaled 555,728.

Secretary Hoover of the Department of Commerce, has received a large number of replies to his letter requesting trade associations to co-operate with the railroads in securing the most efficient use of cars. The replies indicate a desire on the part of shippers to co-operate as much as possible with the railroads. F. R. Wadleigh, federal fuel distributor, who is working with Secretary Hoover in promoting the campaign, is understood to be preparing a statement advocating general industrial storage of coal during the summer.

The Pacific Great Eastern announces that 24-hour tourist and standard sleeping car service is to be established over its road, which extends from Squamish, B. C., to Quesnel, B. C. The length of this road is 348 miles which makes the rate of speed about 15 miles an hour. From the timetable heretofore in effect, it appears that the through train of this road, northward, makes the trip in 29½ hours, and southward in 25½ hours. This train appears in the Official Guide as a Mixed train, running once a week each way. On the northbound trip it starts on Monday and oon the southbound on Wednesday.

Traffic Statistics for February and Two Months

Revenue freight traffic of the Class I railroads for the month of February amounted to 29,433,687,000 ton-miles as compared with 25,453,131,000 in February, 1922, according to the Interstate Commerce Commission's monthly summary of traffic statistics. The number of passengers carried one mile was 2,566,616,000 as compared with 2,397,110,000 in February last year. For the two months ended with February, the revenue ton miles aggregated 69,359,270,000 as compared with 49,176,484,000 in the corresponding period of last year and the revenue passenger miles aggregated 5,500,826,000 as compared with 5,101,928,000.

Thornton Offers to Reduce Rates on Alberta Coal

Sir Henry Thornton, president of the Canadian National, has informed J. S. McLennan, chairman of the Canadian Senate Committee on Fuel Supply, that the C. N. R. is prepared to handle Alberta coal in trainload lots to points in Ontario at a rate of $9 per ton, which is $3.70 lower than the present rate. The proposed lower rates would apply only during May, June and July. Sir Henry said that similar reductions could be made to favor coal from the Maritime Provinces.

An effort is being made to promote the use of Canadian coal in Canada to make the country independent of supplies from the United States. The $9 rate quoted by Sir Henry is said to be the result of a careful investigation by C. N. R. officers and to represent the bare cost of handling the business plus a small allowance for overhead.

Commission and Court News

Interstate Commerce Commission

The commission has announced hearings in connection with its investigation of the adequacy of transportation facilities in the Northwest Pacific states, on June 18 at Pocatello, Idaho, and on July 17 at Seattle, Wash., before Commissioner Aitchison and Examiner Eshelman.

Arguments on the method of determining the amounts to be allowed for working capital in the commission's valuation reports will be heard by Division 1 of the commission at Washington on May 24 in the cases of the Delaware & Hudson, the Oregon-Washington, the Hartford Eastern, the Nevada Northern, the Great Northern and the Wisconsin & Northern.

State Commissions

The New York State Public Service Commission, following an investigation of the suburban train service of the New York, New Haven & Hartford to and from New York City, in which it finds a deficiency of facilities for punctual movement of trains, has ordered the company to provide additional shop facilities for the inspection and repair of multiple unit electric trains, such facilities to be ready by January 1 next; to put the steam heaters on electric motors in good condition by October 15; to put in service by February 1 at least three additional multiple unit motor cars; and to develop plans for the rearrangement of tracks at New Rochelle junction so that movements to and from the Harlem River branch may be made without the necessity of crossing tracks at grade. On this last feature a report must be made to the commission by January 1.

Personnel of Commissions

James A. Parsons has been appointed a member of the New York Public Service Commission in place of Charles G. Blakeslee. Mr. Parsons has been attorney general and legal adviser to the governor.

Col. James G. Steese, president of the Board of Road Commissioners of Alaska, has been appointed also chairman and chief engineer of the Alaska Railway Commission, succeeding Col. Frederick Mears, who has been assigned to army duty.

Court News

Damages for Loss of Contract Through Wrongful Ejection Not Recoverable

In an action for wrongful ejection it appeared that the passenger was on his way to a distant town to employ men for a lumber company with which he had a contract, and that by his failure to meet the men he lost his contract. The North Carolina Supreme Court holds that he could not recover damages arising out of the loss of his contract, such damage not arising fairly and reasonably out of the carrier's breach of contract.—Johnson v. A. C. L. (N. Car.), 113 S. E. 606.

Excessive Damages

The Montana Supreme Court holds that a verdict of $15,000 for injuries to an engineman (30 years old and with maximum earnings of $200 a month) causing an extreme case of "flat feet," but not shown to be permanent so as to disable him from following his own or some other profitable employment, was excessive. Being not only unsupported by the evidence, but manifestly contrary thereto, and therefore apparently given under the influence of passion or prejudice, a new trial on this question was required, and not a mere reduction by the court.—Gillespie v. Great Northern (Mont.) 208 Pac. 1059.

Foreign Railway News

Sir William Acworth to Study Austrian Railways

Sir William Acworth, the well-known British railway economist, has been appointed to the post of adviser to the Austrian government in the study which it is undertaking of its railway problem.

Austrian Locomotive Industry Thrives

Recent orders for locomotives from Yugoslavia, Rumania, and Hungary, in addition to those of the Austrian State Railways, are sufficient to keep the Austrian locomotive factories busy for some time, according to the Neues Wiener Journal, as reported by Consul Weingartner at Vienna.

The Austrian government has ordered 17 electric locomotives for the Arlberg and Salzkammergut railways. The Italian State Railways have placed an order in Austria for 200 locomotives to be delivered within 3 years. The Neue Freie Presse reports this to be the first order of Italian State Railways placed outside of Italy.

Arbitration Courts to Deal with Labor Matters in Argentina

BUENOS AYRES.

The Argentine government has issued several decrees providing for the constitution of arbitration courts which are to deal with all questions arising between railways and their employees, and specifically, with the claims of the shop employees to an annual vacation of eight days on full pay. The railway companies have presented on their part a joint memorial to the Minister of Public Works objecting to the proposed arbitration procedure—alike in the case at issue and as a general principle—on the ground that it is unconstitutional. The companies in the concluding portion of their memorial quote recent utterances by the present Minister of the Interior, formerly Solicitor General. The Minister, Doctor Matienzo, replying a few weeks ago to a question in the Chamber of Deputies said that the decrees governing the matter were not at all in accord with the law.

Reorganization of South Australian Railways

The reorganization of the South Australian Railways under the plan of W. A. Webb, chief commissioner, has been announced as follows:

A. N. Day, general traffic manager, will deal with traffic matters only and will relinquish his duties in the operating department.

B. H. Gillman, passenger superintendent, has been appointed assistant general traffic manager.

G. J. Smith, goods superintendent, has been appointed general superintendent.

R. S. Ross, superintendent of station service, has been appointed special representaive on the staff of the commissioners.

C. G. Pilkington, assistant engineer for yards and signals, has been appointed engineer of signals and telegraphs.

F. W. Stephen, chief engineer for railways, retains that position and has appointed to his staff A. E. Welbourn as chief assistant engineer and W. W. Andrews as assistant engineer for railway construction.

F. J. Shea, acting chief mechanical engineer, will retain that position.

The railway has been divided into six operating divisions with a superintendent in charge of each. The purpose of the reorganization was to bring about decentralization. Chief Commissioner Webb, who was appointed to that position in September of last year, was formerly president of the Cambria & Indiana and has held various official positions in the operating departments of a number of American railways.

Equipment and Supplies

Locomotives

THE SAVANNAH & ATLANTA is inquiring for two locomotives.

THE UTAH COPPER COMPANY has ordered five 0-6-0 type switching locomotives from the Baldwin Locomotive Works.

THE CHINO COPPER COMPANY has ordered four 0-6-0 type switching locomotives from the American Locomotive Company.

THE FERROCARRILES DE NORTE DE CUBA has ordered two 6-wheel switching locomotives from the Baldwin Locomotive Works.

THE NIAGARA JUNCTION RAILROAD has ordered from the Westinghouse Electric & Manufacturing Company two 43-ton electric locomotives.

THE LOUISIANA & ARKANSAS, reported in the *Railway Age* of May 5 as inquiring for two Mikado type locomotives, has ordered this equipment from the Baldwin Locomotive Works.

THE MINNEAPOLIS, NORTHFIELD & SOUTHERN, reported in the *Railway Age* of May 5 as inquiring for two Mogul type locomotives, has ordered this equipment from the H. K. Porter Company.

THE MISSOURI PACIFIC, reported in the *Railway Age* of May 5 as inquiring for 40 Mikado type and 10 Pacific type locomotives, has ordered this equipment from the American Locomotive Company.

THE LEHIGH VALLEY, reported in the *Railway Age* of April 21 as contemplating placing an order for 10 Pacific type locomotives, has ordered this equipment from the American Locomotive Company.

THE SEABOARD AIR LINE has ordered 2 Mikado type locomotives from the American Locomotive Company. This is in addition to the 20 Mikado type ordered from the same builder reported in the *Railway Age* of March 24.

Freight Cars

THE NORFOLK SOUTHERN is inquiring for 100 hopper cars and 100 gondola cars.

THE TRUMBULL STEEL COMPANY is inquiring for 75 flat bottom gondola cars of 50-tons' capacity.

THE MINNESOTA STEEL COMPANY reported in the *Railway Age* of May 5 as inquiring for 20 flat cars and 20 gondola cars is also inquiring for 44 hopper bottom coal cars.

THE HURLEY GASOLINE COMPANY, TULSA, OKLA., has ordered five gasoline tank cars of 8,000-gal. capacity from the Pennsylvania Tank Car Company. This is in addition to the five ordered from the same builder as was reported in the *Railway Age* of April 14.

Passenger Cars

THE CANADIAN NATIONAL has ordered 30 steel sleeping cars from the Canadian Car & Foundry Company.

Signaling

THE PHILADELPHIA & READING has let to the Union Switch & Signal Company a contract for the installation of an electropneumatic interlocking at Camden, N. J., to serve the new passenger terminal now being built. The terminal station will have 16 platform tracks, and the interlocking machine (75-lever frame) will have 22 working levers for 72 signals, 35 working levers for 44 switches and 4 double switches with movable point frogs, a total of 135 functions. There will be 55 a.c. track circuits. All track relays will be installed in the tower. A fireproof sectional steel relay cabinet will be placed in the tower for the termination of all wires and cables.

Supply Trade News

The Jones & Laughlin Steel Corporation has purchased 319 acres of land near Hammond, Ind., on which a plant will be constructed.

The Nathan Manufacturing Company, New York, has removed its Chicago office from 707 Great Northern building to 14 East Jackson boulevard.

Oliver W. Loomis, manager of sales of the **National Malleable Castings Company,** Cleveland, Ohio, has been appointed manager of the company's malleable plants at Chicago with office at 2610 West Twenty-fifth place. Mr. Loomis succeeds O. J. Fehling, who has resigned. **James A. Slater,** assistant manager of sales, has been appointed manager of sales with headquarters at Cleveland to succeed Mr. Loomis. Oliver W. Loomis was born in Bloomington, Ill., but spent his early boyhood in New Haven, Conn., before going to Cleveland. He has been connected with the National Malleable Castings Company since March, 1891, having served consecutively in the accounting, manufacturing and sales departments. He was manager of sales at the time of his recent appointment as manager of the malleable plants at Chicago.

O. W. Loomis

J. A. Slater

James A. Slater, the new manager of sales, has been in the service of the National Malleable Castings Company continuously for the past 26 years. He served in various capacities both at Cleveland and at Chicago, in the purchasing and the sales departments and in his new position as manager of sales, with headquarters at Cleveland, he will have charge of both the railway and the miscellaneous sales of the organization.

The O. K. Company, dealing in general railroad and steamship supplies, has moved its general sales office to 555 Railway Exchange building, Chicago.

E. A. Thornwell, Candler building, Atlanta, Ga., has been appointed sales representative of the **Edgewater Steel Company,** Pittsburgh, Pa., vice John Hyland, deceased.

The National Lumber Manufacturers Association of Chicago has removed its office from the Harris Trust building to 2017 Conway building, 111 W. Washington street, Chicago.

S. P. Wright & Company, district representatives of the **Conveyors Corporation of America,** Chicago, has removed its Butte, Mont., office from 109 East Broadway, to 812 East Iron street.

The Howell Electric Motors Company, Howell, Mich., has opened a New York City office at 17 East Forty-second street, with **R. W. Baker** in charge as New York district manager.

H. B. Doerr, chief mechanical engineer of the **Scullin Steel Company,** with headquarters at St. Louis, Mo., has been promoted to general superintendent, succeeding L. C. Perry, resigned to engage in private business.

W. E. Brewster, advertising manager of the **U. S. Light & Heat Corporation,** Niagara Falls, N. Y., has resigned and **E. D. Giauque,** who has been Mr. Brewster's assistant, has been appointed to succeed him as advertising manager.

Poultney Gorter, heretofore in the contracting department and various other departments at the shops of the **Pullman Company,** has been appointed assistant to the eastern sales manager of the **Pullman Company,** 25 Broadway, New York City.

E. W. Rockafellow, assistant general sales manager of the Western Electric Company, New York City, has resigned to become vice-president of the **National Pole Company,** Escanaba, Mich. Mr. Rockafellow's headquarters are at 220 Broadway, New York City.

Robert H. Gwaltney, whose appointment as vice-president of the **T. H. Symington Company,** New York, was announced in the *Railway Age* May 5, was born in Raleigh, North Carolina. He entered the service of the T. H. Symington Company in 1912 as sales agent and remained in that position until 1917, when he was appointed to the position of manager of eastern sales. Mr. Gwaltney now becomes vice-president of the same company with headquarters at New York City in charge of eastern sales, and he will also have supervision of the southern territory formerly handled in Baltimore, Md., by T. C. deRosset, deceased.

R. H. Gwaltney

Walter Goodenough has joined the staff of **Dwight P. Robinson & Co., Inc.,** New York. **Rawson Collier,** until recently general sales manager of the Central Hudson Gas & Electric Company, has also joined the organization of Dwight P. Robinson & Co., Inc.

The American Insulated Wire & Cable Company of Chicago, Ill., is now manufacturing magnet wire, having begun operations April 1. Its products are sold under the trade name A-1 Magnet Wire and consists of the following: plain enameled, single cotton covered, double cotton covered, single cotton enameled, double cotton enameled, single silk covered, double silk covered, single silk enameled and double silk enameled.

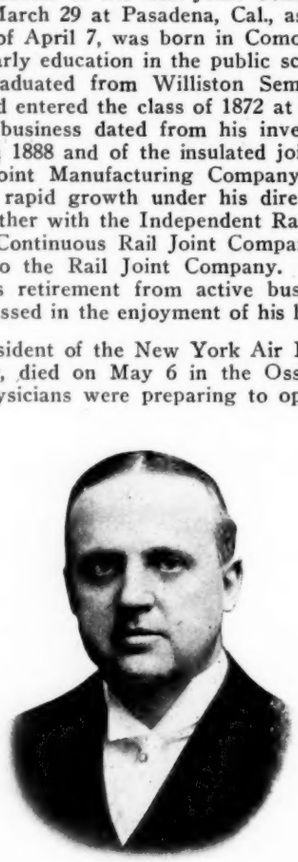
The Electrical Storage Battery Company, Philadelphia, Pa., announces a plan for the purchase of the company's stock by its employees who desire to become stockholders. Under the plan, employees of the company on May 1, 1923, who have served continuously for the previous two years or more, may buy one share of common stock at $53 a share for each $500 of their annual compensation but not exceeding 20 shares to any one employee; payment for the stock must be made by installments at the rate of one dollar a share a month. If an employee leaves the service of the company before his stock is fully paid for, his purchase agreement shall be canceled and the net amount paid in by him on the stock shall be returned to him with interest at the rate of five per cent per annum.

Obituary

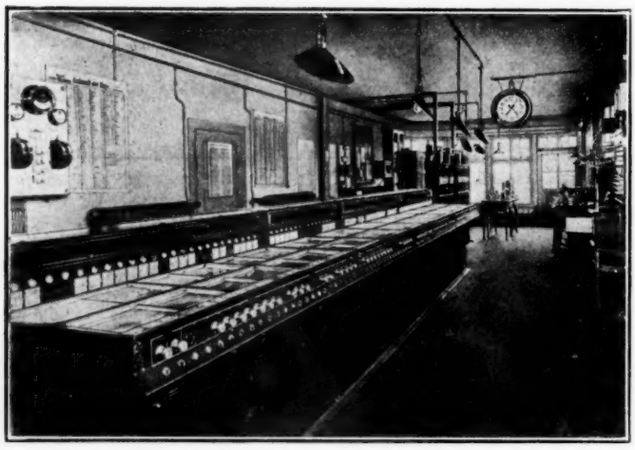
John Gilbert Ward, treasurer of the Babcock & Wilcox Company, New York City, died on April 22.

George Adam Weber, director of the Rail Joint Company, New York, who died on March 29 at Pasadena, Cal., as was noted in the *Railway Age* of April 7, was born in Como, Ill., in 1848, and received his early education in the public schools of Chicago. Later he graduated from Williston Seminary at Easthampton, Mass., and entered the class of 1872 at Yale. His greatest successes in business dated from his invention of the Weber Rail Joint in 1888 and of the insulated joint in 1894. The Weber Rail Joint Manufacturing Company was formed in 1889 and made rapid growth under his direction. In 1905, this company together with the Independent Railway Supply Company and the Continuous Rail Joint Company of America, were merged into the Rail Joint Company. This consolidation permitted his retirement from active business and his later years were passed in the enjoyment of his home.

Scott R. Hayes, vice-president of the New York Air Brake Company, New York City, died on May 6 in the Ossining (N. Y.) hospital while physicians were preparing to operate on him. Mr. Hayes was born on February 8, 1871, at Columbus, Ohio. In 1890 he left Cornell University to go with the Thompson-Houston Company with headquarters at Cincinnati, Ohio. In 1892, when the General Electric Company was formed, Mr. Hayes was placed in charge of its Cleveland office and remained in that position until the latter part of 1894. During 1895 and 1896, he was in the electrical supply business at Cleveland, Ohio, under the firm name of Hayes & Arthur. In 1897, he was appointed agent for the Scott Spring Company with office at Cleveland and one year later he went to Chicago as representative for that company. When the Railway Steel Springs Company was organized in 1902, he was transferred to the New York office as assistant sales agent, subsequently serving as general sales agent and vice-president. He resigned from the latter position in March, 1914, to become assistant to the president of the New York Air Brake Company and subsequently become vice-president of that company. He was a son of former President Rutherford B. Hayes.



S. R. Hayes



Train "Control" Office for All Railways in the Ruhr

Railway Construction

BUFFALO, ROCHESTER & PITTSBURGH.—This company has awarded to the G. C. Cleaver Company, Punxsutawney, Pa., a contract for grading in connection with additions to its yard at Cloe, Pa. The company has awarded a contract to the Miller Construction Company, Punxsutawney, Pa., for the construction of additional passing sidings at Valier, Pa.

CHICAGO & NORTH WESTERN.—This company, which was reported in the *Railway Age* of February 3 as contemplating the construction of additional shop facilities at Madison, Wis., has authorized the construction of a 30-stall roundhouse, a machine and repair shop, a car foreman's shop and an ice house. Work on the improvements will be begun shortly and will cost approximately $500,000.

CHICAGO & NORTH WESTERN.—This company has been ordered by the Railroad Commission of South Dakota to relocate its line through and construct passenger and freight station facilities in the town of Newell, S. D. The present line passes approximately one mile from the business center.

CHICAGO & NORTH WESTERN.—This company has awarded a contract to the Ogle Construction Company, Chicago, for the construction of a 250-ton, reinforced concrete coaling station at Evansville, Wis.

CHICAGO & NORTH WESTERN.—This company has awarded a contract to G. A. Johnson & Sons, Chicago, for the construction of a roundhouse at Casper, Wyo., as reported in the *Railway Age* of April 28.

CHICAGO, BURLINGTON & QUINCY.—This company will close bids on May 21 for the construction of a 50-ton coaling station at Clarinda, Ia. The company has awarded a contract to G. A. Johnson & Sons, Chicago, for the construction of a machine shop at Beardstown, Ill.

DETROIT, TOLEDO & IRONTON.—This company has awarded a contract to F. R. Jones Company, Detroit, Mich., for the construction of a cut off to the River Rouge plant, as reported in the *Railway Age* of April 28.

ELGIN, JOLIET & EASTERN.—This company will construct a second track between Coyne's, Ill., and the Des Plaines river, a distance of five miles, at a cost of approximately $400,000.

THE ERIE will renew the overhead contact wire between Avon and Rochester on the electric line which runs from Mount Morris to Rochester. The distance from Avon to Rochester is 19 miles. The contact wire now in use is steel and it will be replaced with Phono-Electric wire.

GREAT NORTHERN.—This company will construct seven miles of second track between Kandiyohi, Minn., and Atwater, at a cost of $350,000, and will enlarge the stockyards at Willmar, Minn., at a cost of $25,000.

ILLINOIS CENTRAL.—This company has authorized the construction of water treating plants at Parkersburg, Ia., Iowa Falls, Webster City and Marcus, and at Haldane, Ill., Dixon and Panola. This company has also authorized the construction of a 4,600 ft. passing track at Iowa Falls, Ia., a 110-car capacity passing track at Galton, Ill., a 96-car passing track at Decatur, Ill., and 28,000 ft. of storage track at Bloomington, Ind. This company has awarded a contract to A. W. Stoolman, Champaign, Ill., for the construction of a brick passenger station at Vandalia, Ill., reported in the *Railway Age* of February 17.

INTER-CALIFORNIA.—The Interstate Commerce Commission, on the joint application of this company and the Southern Pacific, has issued a certificate authorizing the construction by the Inter-California of a branch line from Calipatria to a point 6.7 miles north of Holtville, Cal., 21.3 miles, to be operated by the Southern Pacific.

MISSOURI PACIFIC.—This company has authorized the construction of a new machine shop at Wichita, Kan., to cost $78,000, and the construction of a viaduct at Fourteenth street, St. Louis, Mo., which will cost $130,000. This company has also authorized the construction of necessary facilities for handling fuel oil for locomotives, including storage at large terminals and outlying supply stations, on the Arkansas, Louisiana and Memphis divisions, which will cost $350,000. The Missouri Pacific has also authorized the construction of extensions to 11 passing tracks on the Central Kansas-Colorado division, to cost $68,000; the construction of a new brick station at Washington, Mo., to cost $55,000; the construction of four new piers for a bridge at Corning, Ark., and the raising and extension of a bridge at Kansas City, Kan., to cost $175,000. Construction contemplated by this company includes a new eight-stall engine house at Osawatomie, Kan., which will cost $52,000; the installation of a 100-ft. turntable and additions to an enginehouse at Van Buren, Ark., to cost $72,000; the construction of a water station and treating plant at Horace, Kan., to cost $55,000 and industrial tracks at various points on the line, the total cost of which will be $100,000. The purchase of land at Kansas City, Mo., for the construction of additional freight yard facilities has also been authorized.

PERE MARQUETTE.—This company contemplates the construction of additional terminal facilities at Erie, Mich. Included in the project are the construction of 34 additional storage tracks with a capacity of 5,000 cars and the construction of a 16-stall roundhouse, a machine shop and a service building for the employees.

SOUTHERN.—This company, it is reported, is planning the erection of a 10-story office building, 50 ft by 100 ft., at Birmingham, Ala.

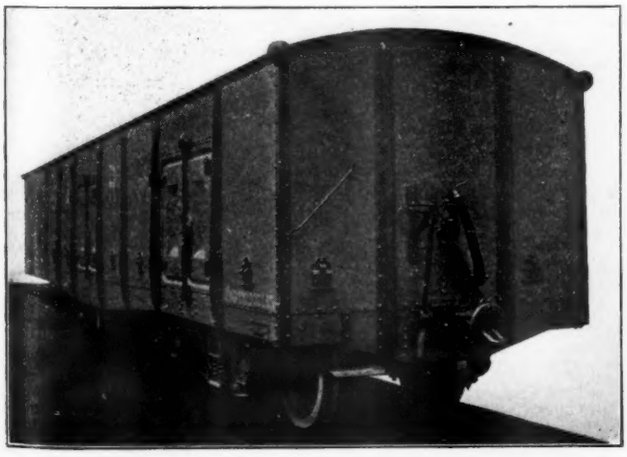
SOUTHERN PACIFIC.—The Interstate Commerce Commission has issued a certificate authorizing this company to construct a branch line from a point about four miles south of Bakersfield, Cal., to a site of a proposed packing house south of the village of Arvin, a distance of 17.64 miles, with a spur track of 1.78 miles.

SPOKANE INTERNATIONAL.—This company will reconstruct its tunnel at Bonner's Ferry, Wash., at a cost of approximately $75,000.

ST. LOUIS-SAN FRANCISCO.—This company has awarded a contract to the Howlett Construction Company, Moline, Ill., for the erection of a 300-ton, reinforced concrete coaling station at East Thomas, Ala.

THE SOUTHERN PACIFIC.—This company is constructing with its company forces a 16-stall roundhouse, machine shop, power house, car repair shed, mill building, oil house and an employees' building at Lafayette, La.

WASHINGTON TERMINAL.—This company has awarded a contract to the Ogle Construction Company, Chicago, for the construction of a 1,200-ton, five-track, reinforced concrete coaling station with sanding facilities at Washington, D. C.



A 50-Ton, All-Steel Gondola in South Africa

Railway Financial News

BELT RAILWAY OF CHICAGO.—*Annual Report.*—The annual report for the year ended December 31, 1922, shows a net income of $259,530 as compared with $172,800 in 1921. A selection of the principal items in the income account follows:

	1922	1921
Operating revenues	$6,184,668	$5,495,789
Operating expenses	4,093,253	4,028,761
Net from railway operation	2,091,415	1,467,028
Railway tax accruals	417,596	340,320
Railway operating income	1,673,819	1,126,708
Non-operating income	132,475	586,286
Gross income	1,806,294	1,712,994
Total deductions from gross income	1,546,764	1,540,194
Net income	259,530	172,800
Dividend appropriation of income	172,800	172,800
Income transferred to suspense	86,730	.....

BOSTON & PROVIDENCE.—*Authorized to Issue Bonds.*—This company has been authorized by the Interstate Commerce Commission to issue $2,170,000 of 5 per cent gold debenture bonds, to be sold at par and the proceeds used to redeem a like amount of 6 per cent bonds which will mature July 1, 1923.

CANADIAN PACIFIC.—*New Director.*—F. W. Molson, president of Molson's Bank, has been elected a director for four years in place of Richard B. Angus, deceased.

CENTRAL OF GEORGIA.—*Asks Authority for Bond Issue.*—This company has applied to the Interstate Commerce Commission for authority to execute and authenticate $850,000 of 6 per cent general mortgage bonds.

Asks Authority for Equipment Trust.—The Central of Georgia has applied to the Interstate Commerce Commission for authority to issue $3,880,000 of 5 per cent equipment trust certificates to be sold at 95½.

CENTRAL OF NEW JERSEY.—*Asks Authority for Equipment Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue $3,750,000 of 5 per cent equipment bonds.

CHICAGO & NORTH WESTERN.—*Annual Report.*—The annual report for the year ended December 31, 1922, shows a net income of $8,897,536 available for dividends as compared with a net loss of $1,245,433 in 1921. A selection of the principal items in the income account follows:

	1922	1921	Increase or Decrease
Freight	$100,700,614	$95,687,013	$5,013,601
Passenger	29,177,834	33,770,082	—4,592,248
Total operating revenues	146,100,437	144,775,476	1,324,961
Maintenance of way and structures	18,076,843	20,492,808	—2,415,965
Maintenance of equipment	30,456,070	33,056,791	—2,600,721
Traffic	1,818,545	1,876,730	—58,185
Transportation	11,406,766	12,241,238	—834,472
General	3,744,526	4,215,437	—470,911
Total operating expenses	119,191,134	129,091,428	—9,900,293
Net revenue from railway operations	26,909,303	15,684,048	11,225,255
Railway tax accruals	8,998,100	8,464,087	534,013
Railway operating income	17,877,373	7,201,883	10,675,490
Net railway operating income	17,036,305	6,651,137	10,385,168
Total non-operating income	3,309,403	3,935,387	—625,983
Gross income	20,345,709	10,586,524	9,759,184
Total deductions from gross income	11,448,173	11,831,957	—383,784
Net income	8,897,536	Dr. 1,245,433	10,142,969
Dividends:			
7 per cent on preferred stock	1,567,650	1,567,650	.....
5 per cent on common stock	7,257,625	7,257,625	.....
Total dividends	8,825,275	8,825,275	.....
Balance income for year	72,261	Dr. 10,070,708	10,142,969

CHICAGO, MILWAUKEE & ST. PAUL.—*Annual Report.*—The annual report for the year ended December 31, 1922, shows a net deficit of $6,143,168 as compared with a net deficit of $11,070,609 in 1921. A selection of the principal items in the income account follows:

	1922
Operating revenues	$156,950,628
Operating expenses	129,596,696
Net railway operating revenues	27,353,932
Railway tax accruals	9,654,738
Railway operating income	17,692,660
Net railway operating income	13,284,245
Net railway and non-operating income	14,858,945
Total deductions	21,002,113
Deficit	6,143,168

CHICAGO, BURLINGTON & QUINCY.—*Annual Report.*—This company's annual report for 1922 is reviewed in an article on another page of this issue entitled "Rate Reductions and Strikes Cut Burlington's Net." See also excerpts from annual report on adjacent pages.

CHICAGO, ST. PAUL, MINNEAPOLIS & OMAHA.—*Annual Report.*—The annual report for the year ended December 31, 1922, issued last week, shows a net income before dividends of $1,177,929 as compared with a net loss of $285,677 in 1921. A selection of the principal items in the income account follows:

	1922	1921	Increase or Decrease
Freight	$19,602,694	$19,285,657	$317,037
Passenger	6,110,337	6,865,280	—754,943
Total operating revenues	27,801,007	28,137,408	—336,401
Maintenance of way and structures	3,526,300	3,628,793	—102,494
Maintenance of equipment	5,011,252	5,722,757	—711,505
Traffic	409,486	407,944	1,542
Transportation	12,390,761	13,574,178	—1,183,417
General	849,811	932,283	—82,473
Total operating expenses	22,297,051	24,392,314	—2,095,263
Net revenue from railway operations	5,503,956	3,745,093	1,758,863
Railway tax accruals	1,545,993	1,265,198	280,795
Railway operating income	3,944,933	2,461,188	1,483,745
Net railway operating income	3,812,671	2,065,349	1,747,321
Total non-operating income	247,107	308,629	—61,522
Gross income	4,059,778	2,373,978	1,685,800
Total deductions from gross income	2,881,849	2,659,656	222,194
Net income	1,177,929	Def. 285,677	1,463,606
Dividends:			
On preferred stock 7 per cent	788,151	788,151	.....
On common stock 5 per cent	927,835	927,835	.....
Total	1,715,986	1,715,986	.....
Balance loss for the year	538,057	2,001,663	—1,463,606

DELAWARE & HUDSON.—*New Director.*—John T. Pratt has been elected a director to succeed William S. Opdyke, deceased.

Lease Approved.—The lease of the Utica, Clinton & Binghamton and of the Rome & Clinton to the New York, Ontario & Western has been approved by the stockholders.

DULUTH, SOUTH SHORE & ATLANTIC.—*Annual Report.*—The annual report for the year ended December 31, 1922, shows a net deficit of $727,210 as compared with a net deficit of $1,582,853 in 1921. A selection of the principal items in the income account follows:

	1922	1921
Freight revenue	$2,733,742	$2,697,429
Passenger revenue	1,083,944	1,172,270
Total operating revenue	4,495,812	4,452,424
Maintenance of way and structures	729,395	914,799
Maintenance of equipment	688,551	978,138
Traffic	80,715	80,118
Transportation	2,264,069	2,401,316
General	135,079	148,120
Total operating expenses	3,961,793	4,601,855
Net operating revenue	534,019	Def. 149,431
Railway tax accruals	383,619	352,985
Gross income	206,620	Def. 455,190
Total deductions from gross income	933,830	1,127,662
Net deficit	727,210	1,582,853

GRAND TRUNK.—*Annual Report.*—The annual report for the year ended December 31, 1922, shows a net loss of $8,411,734 as compared with a net loss of $14,064,442 in 1921. The income account folows:

	1922	1921
Freight revenue	$56,561,068	$54,239,904
Passenger revenue	14,342,003	15,510,164
Total operating revenues	77,700,019	76,858,032
Maintenance of way and structures	10,740,706	12,862,797
Maintenance of equipment	20,792,314	17,809,497
Traffic	1,815,853	1,583,830
Transportation	34,020,649	35,574,798
General	2,560,591	2,904,024
Total operating expenses	70,317,813	71,179,293
Net revenue from railway operations	7,382,206	5,678,739
Railway tax accruals	1,200,287	1,325,577
Operating income	9,636,264	7,295,807
Net operating income	9,265,851	6,828,314
Non-operating income	5,347,825	5,691,457
Gross income	14,613,676	12,519,771
Total deductions from gross income	23,025,410	26,584,213
Income balance	Def. 8,411,734	Def. 14,064,442

MARYLAND, DELAWARE & VIRGINIA.—*Sold.*—The E. B. Leaf Company, of Philadelphia, Pa., dealers in iron and steel, bought this road at foreclosure on May 7 with the intention of scrapping it. The company is controlled by the Baltimore, Chesapeake & Atlantic, a subsidiary of the Pennsylvania, through stock ownership. The total length of railroad and steamer lines operated is 1,052 miles.

Plans are being completed for an appeal to the Interstate Commerce Commission by Governor Ritchie, of Maryland, to prevent abandonment of the company's rail line running from Love Point to Lewes, Del. Turnbull Murdoch, president of the Maryland, Delaware & Virginia, says it has been a losing proposition ever since the start of state-subsidized ferry lines to Eastern shore points. Shipment of freight by automobile truck has also cut into the road's revenues.

MICHIGAN CENTRAL.—*New Director.*—Bertram Cutter has been elected a director to succeed William Rockefeller, deceased.

MINNEAPOLIS & ST. LOUIS.—*New Directors.*—Leroy W. Baldwin, Franklin Q. Brown and W. L. McKenna, all of New York, have been elected directors.

MISSOURI-KANSAS-TEXAS.—*Leasing of Property.*—The stockholders of this company will decide at a special meeting on June 28 whether to lease to the Wabash, with option to purchase, the line from Moberly, Mo., to Hannibal, including the Hannibal terminal. The stockholders will also decide upon the acquiring of the capital stock of the Okmulgee Northern, which operates a short line in Oklahoma.

MISSOURI, KANSAS & TEXAS.—*Annual Report.*—The annual report for the year ended December 31, 1922, shows a net income of $4,117,478 as compared with $5,901,349 in 1921. A section of the principal items in the income account follows:

	1922	1921	Increase or Decrease
Freight	$39,198,401	$43,782,692	—$4,584,291
Passenger	10,958,412	13,904,680	—2,946,268
Total operating revenue	55,035,702	63,020,975	—7,985,274
Maintenance of way and structures	7,237,277	9,835,638	—2,598,362
Maintenance of equipment	10,548,094	13,803,427	—3,255,333
Traffic expenses	1,041,436	1,064.545	—23,110
Transportation expenses	18,780,007	22,866.805	—4,086,798
General expenses	2,023,709	2,294,130	—270,421
Total operating expenses	39,683,701	50,055,784	—10.372,083
Net operating revenue	15,352,001	12,965,191	2,386,810
Railway tax accruals	2,926,377	2,612,463	313,914
Total operating income	12,394,269	10,340.427	2,053,842
Total non-operating income	999.571	4,525.704	—3,526.134
Gross income	13,393,840	14,866,132	—1,472,292
Total deductions from gross income	9,276,363	8,964,782	311,580
Net income	4,117,478	5,901,349	—1,783,872

There was included in the 1921 income, to close the guaranty period and to comply with the requirements of the Interstate Commerce Commission:

Guaranty period unaudited accounts (debit)	742,009
Guaranty period advances (credit)	3,857,800
Kansas City Terminal Railway Co. undistributed income (credit)	111,217
Total	$3,227,008
The net income for the year 1921, with these items omitted would have been	$2,674,341

MISSOURI PACIFIC.—*Annual Report.*—The annual report for the year ended December 31, 1922, shows a net loss of $1,413,712 as compared with a net income of $3,537,016 in 1921. The corporate income account compares as follows:

	1922	1921	Increase or Decrease
Operating revenues	$99,921,337	$109.785,950	—$9,864,619
Operating expenses	84,658,915	191,693,856	—7,034,941
Net revenue from railway operations	15,262,416	18,092,094	—2,829,678
Railway taxes and uncollectible railway revenue	4,055,984	4,396,529	—340,545
Railway operating income	11,206,433	13,695,565	—2,489,132
Other operating income	823,584	799,174	24,410
Total operating income	12,030,017	14,494,739	—2,464,722
Deductions from operating income	3,782,982	4,257,891	—474,908
Net railway operating income	8,247,035	10,236,848	—1,989,814
Non-operating income	2,463,783	3,061,557	—597,774
Government guaranty	.....	1,972,080	—1,972,080
Gross income	10,710,818	15,270,487	—4,559,669
Deductions from gross income	12,124,530	11,733,471	391,060
Balance, net income	Def. 1,413,712	3,537,016	—4,950,729

NASHVILLE, CHATTANOOGA & ST. LOUIS.—*Annual Report.*—The annual report for the year ended December 31, 1922, shows a net income of $1,680,522 as compared with a net loss of $259,802 in 1921. A selection of the principal items in the income account follows:

	1922	1921
Freight revenue	$16,055,719	$14,323,243
Passenger revenue	4,678,038	5,115,363
Total operating revenues	22,353,763	20,924,602
Maintenance of way and structures	3,339,580	3,065,616
Maintenance of equipment	5,464,098	5,501,899
Traffic	818,197	833,828
Transportation	8,820,897	9,465,005
General	9,339	2,135
Total operating expenses	19,207,688	19,607,276
Railway tax accruals	420,000	550,000
Operating income	2,709,083	758,638
Non-operating income	847,243	882,933
Gross income	3,556,326	1,641,571
Total deductions from gross income	1,875,804	1,901,373
Net income	1,680,522	Def. 259,802

NEW ORLEANS, TEXAS & MEXICO.—*Annual Report.*—The annual report for the year ended December 31, 1922, shows an income balance of $237,309 as compared with $599,312 in 1921. A selection of the principal items in the income account follows:

	1922	1921	Increase or Decrease
Freight	$7,811,368	$8,159,444	—$348,076
Passenger	1,914,565	2,284,941	—370,376
Total operating revenues	10,413,975	11,090,101	—676,126
Maintenance of way and structures	1,837,921	1,999,098	—121,040
Maintenance of equipment	1,586,517	1,767,844	—181,327
Traffic	319,891	311,555	8,336
Transportation	2,785,312	3,697,160	—911,848
General	413,887	468,070	—54,183
Total operating expenses	6,926,774	8,215,473	—1,288,700
Net revenue from railway operations	3,487,201	2,874,628	612,573
Railway tax accruals	549,931	426,094	123,637
Railway operating income	2,932,835	2,443,249	489,586
Net railway operating income	2,815,848	2,141,708	674,140
Total non-operating income	145,487	861,946	—716,459
Gross income	2,961,336	3,003,655	—42,319
Total deductions from gross income	1,239,543	1,190,387	49,156
Net income	1,721,793	1,813,268	—91,475
Dividend appropriations of income	889,852	890,848	—996
Income appropriated for investment in physical property	594,632	323,107	271,524
Total appropriations of income	1,484,484	1,213,955	270,528
Balance transferred to profit and loss	237,309	599,312	—362,003

NEW YORK, CHICAGO & ST. LOUIS.—*Hearing on Consolidation.*—The Interstate Commerce Commission has announced a hearing before Director Mehaffie of the Bureau of Finance at Washington on May 15 on this company's application for a certificate authorizing it to operate in interstate commerce as a consolidation of five roads and for authority to issue securities to the amount of $105,000,000.

Van Sweringen Authorized to be Director.—The Interstate Commerce Commission has issued an order authorizing O. P. Van Sweringen to hold office as a director of this company, in addition to offices previously authorized by the commission.

NEW YORK, NEW HAVEN & HARTFORD.—*Asks Authority to Issue Securities.*—This company has applied to the Interstate Commerce Commission for authority to issue $1,192,000 of 6 per cent notes to be used in the purchase of 12 electric locomotives from the Westinghouse Electric & Manufacturing Company. Authority was also asked for an issue of $3,600,000 of first and refunding mortgage 4 per cent bonds to be exchanged for debentures of the New England Navigation Company and held in the treasury.

SEABOARD AIR LINE.—*Authorized to Issue Bonds.*—The Interstate Commerce Commission has authorized this company to issue $1,957,000 of first and consolidated mortgage 6 per cent gold bonds, part to be pledged with the Secretary of the Treasury as part security for loans previously made by the United States government, and the remainder to be placed in the treasury. The commission, however, has denied authority to issue bonds to cover the cost of issue and sale of bonds. The company has also asked authority to nominally issue such amounts of bonds as may be necessary to provide the security stipulated in connection with a loan of $7,450,000. The application states that the company has advised that the commission has under consideration a certificate for a loan of this amount.

TOLEDO, ST. LOUIS & WESTERN.—*Annual Report.*—The annual report for the year ended December 31, 1922, shows a net income of $1,146,783 as compared with $1,143,991 in 1921. A selection of the principal items in the income account follows:

	1922	1921	Increase or Decrease
Freight	$10,681,350	$8,737,449	$1,943,901
Passenger	360,448	365,258	—4,910
Total operating revenues	11,542,343	9,503,970	2,038,373
Maintenance of way and structures	1,297,063	1,531,323	—234,260
Maintenance of equipment	1,684,451	1,966,428	—281,977
Traffic	255,537	243,932	11,605
Transportation	3,593,406	3,383,736	209,670
General	1,815,450	194,390	1,621,061
Total operating expenses	8,645,606	7,319,062	1,326,544
Net revenue from railway operations	2,896,737	2,184,908	711,829
Railway tax accruals	604,841	438,369	166,472
Railway operating income	2,290,691	1,746,432	544,260
Total non-operating income	347,714	490,647	—142,934
Gross income	2,638,405	2,237,079	401,326
Total deductions from gross income	1,491,622	1,093,088	398,534
Net income	1,146,783	1,143,991	2,792
Income applied to other reserve funds	.....	700	—700
Income balance transferred to credit of profit and loss	1,146,783	1,143,290	3,492

UNION PACIFIC.—*Equipment Trust Authorized.*—The Interstate Commerce Commission has authorized this company to assume obligation and liability in respect of $5,687,000 of equipment trust certificates to be issued by the Bank of North America & Trust Company and sold at not less than 93½. These securities have been sold privately by Kuhn, Loeb & Co.

VIRGINIAN.—*Authorized to Issue Bonds.*—The Interstate Commerce Commission has authorized an issue of $1,846,000 of first mortgage 5 per cent, 50-year gold bonds to be sold at not less than 95, the proceeds to be used in making temporary advances for construction purposes to the Virginian Terminal.

VIRGINIAN.—*Annual Report.*—The annual report for the year ended December 31, 1922, shows an income balance of $3,408,033 as compared with $5,245,827 in 1921. A selection of the principal items in the income account follows:

	1922	1921
Freight	$16,956,023	$15,681,361
Passenger	847,501	978,765
Total operating revenue	19,009,444	18,024,357
Maintenance of way and structures	2,193,206	2,547,898
Maintenance of equipment	4,838,605	3,902,349
Traffic	140,566	123,080
Transportation	4,902,970	5,540,613
General	386,006	396,515
Total operating expenses	12,439,391	12,405,728
Net revenue from operation	6,570,052	5,618,629
Taxes	1,528,916	1,043,175
Income from operation	5,040,845	4,575,084
Gross income	5,922,289	5,374,675
Total deductions from gross income	2,514,256	2,436,943
Net income	3,408,033	2,937,732
Additional compensation received	.....	2,308,095
Net income carried to profit and loss	3,408,033	5,245,827

WESTERN MARYLAND.—*Annual Report.*—The annual report for the year ended December 31, 1922, shows a net income of $33,398 as compared with $474,528 in 1921. The corporate income account follows:

	1922	1921	Increase or Decrease
Operating revenues	$18,575,350	$17,619,972	$955,378
Operating expenses	14,730,157	13,820,664	909,493
Net operating revenue	3,845,193	3,799,308	45,885
Tax accruals	605,000	777,462	—172,462
Total operating income	3,238,094	3,021,186	216,909
Net operating income	3,073,005	3,028,568	44,437
Gross income	3,197,667	3,619,119	—421,453
Total deductions	3,164,269	3,144,592	19,677
Net income	33,398	474,528	—441,130
Settlement of accounts prior to January 1, 1918, made by U. S. R. A.	16,348	Def.53,231	69,579
Credit income balance	49,745	421,296	—371,551

Treasury Payments to Railroads

Since last announcement, dated April 2, 1923, payments under Sections 204, 209, 210 and 212 of the Transportation Act, 1920, as amended, have been made by the Treasury as follows:

Section 204:	
Campbell's Creek Railroad	$6,703
Central West Virginia & Southern	12,644
Lake Erie, Franklin & Clarion	1,986
Reynoldsville & Falls Creek	18,604
South Brooklyn Railway	30,460
Section 209:	
Carolina & Northeastern	7,554
Fourche River Valley & Indian Territory	2,913
Fulton Chain Railway	3,410
Lehigh & New England	179,462
Nashville, Chattanooga & St. Louis	193,961
Northwestern Railroad of South Carolina	15,186
Savannah & Statesboro	3,425
West Virginia Northern	5,245
Winston-Salem Southbound	40,768
Section 210:	
Norfolk, Southern	71,000
Section 212:	
Total	$593,321

Dividends Declared

Canadian Pacific.—Common, 2½ per cent, quarterly, and 3 per cent per annum from special income account, payable June 30 to holders of record June 1.

Cripple Creek Central.—Preferred, 1 per cent, quarterly, payable June 1.

Pittsburgh, Youngstown & Ashtabula.—Preferred, 1¾ per cent, quarterly, payable June 1 to holders of record May 21.

Toronto, Hamilton & Buffalo.—6 per cent, annually, payable June 1 to holders of record May 25.

Trend of Railway Stock and Bond Prices

	May 8	Last Week	Last Year
Average price of 20 representative railway stocks	63.66	64.06	64.95
Average price of 20 representative railway bonds	82.23	82.44	86.07

Annual Reports

Chicago, Burlington & Quincy R. R. Co. — Sixty-Ninth Annual Report

CHICAGO, January 2, 1923.

To the Stockholders of the Chicago, Burlington & Quincy Railroad Company:

The following is the report of your Board of Directors for the year ended December 31, 1922:

COMPARATIVE STATEMENT OF INCOME,

Percent of Ry. Oper. Rev.	YEARS ENDED DECEMBER 31 1922	Railway Operating Revenues	1921	Percent of Ry. Oper. Rev.
73.61	$121,388,901.62	Freight	$122,716,630.31	72.74
17.21	28,380,103.84	Passenger	31,396,048.50	18.61
2.58	4,258,311.92	Mail	4,332,770.88	2.57
2.40	3,948,338.83	Express	3,630,851.56	2.15
2.46	4,059,086.27	All other transportation	3,725,991.29	2.21
1.49	2,461,743.16	Incidental	2,746,655.01	1.62
.25	419,984.90	Joint facility	163,310.60	.10
100.00	$164,916,470.54	Total railway operating revenues	$168,712,268.15	100.00
		Railway Operating Expenses		
12.59	$20,769,379.25	Maintenance of way and structures	$22,917,767.47	13.58
21.67	35,735,413.56	Maintenance of equipment	34,290,506.03	20.32
1.37	2,267,367.08	Traffic	2,102,819.22	1.25
38.13	62,875,593.06	Transportation	63,564,016.74	37.68
1.03	1,693,321.01	Miscellaneous operations	1,734,740.90	1.03
2.59	4,277,202.73	General	4,637,991.86	2.75
.51Cr.	840,573.59	Transportation for investment—Credit	1,031,552.54	Cr. .61
76.87	$126,777,703.10	Total railway operating expenses	$128,216,289.68	76.00
23.13	$38,138,767.44	Net revenue from railway operations	$40,495,978.47	24.00
.....	$10,890,006.82	Railway tax accruals	$9,718,567.64	.....
.....	31,338.17	Uncollectible railway revenue	25,057.02	.....
.....	$27,217,422.45	Railway operating income	$30,752,353.81	.....
		Non-Operating Income		
.....	$454,226.60	Hire of equipment	$614,094.15	.....
.....	522,937.85	Joint facility rent income	254,958.68	.....
.....	723,110.39	Miscellaneous rent income	921,057.50	.....
.....	2,366,498.67	Dividends and miscellaneous interest	2,124,948.48	.....
.....	380,626.11	Miscellaneous income	94,365.07*	.....
.....	$4,447,399.62	Total non-operating income	$4,009,423.88	.....
.....	$31,664,822.07	Gross income	$34,761,777.69	.....
		Deductions from Gross Income		
.....	$1,192,169.77	Hire of equipment	$1,212,423.86	.....
.....	1,850,243.59	Joint facility rents	1,263,975.74	.....
.....	121,296.17	Miscellaneous rents	77,864.43	.....
.....	8,119,271.00	Interest on funded debt	6,807,134.36	.....
.....	10,904.50	Interest on unfunded debt	5,991.66	.....
.....	95,474.06	Amortization of discount on funded debt	57,771.00	.....
.....	13,975.07	Miscellaneous income charges	Cr.273,356.73*	.....
.....	$11,403,334.16	Total deductions from gross income	$9,151,804.32	.....
.....	$25,152,173.54	Net railway operating income (See table foot of page 33)	$29,145,007.04	.....
.....	$20,261,487.91	Net income	$25,609,973.37	.....
		Disposition of Net Income		
.....	$294,250.46	Sinking funds	$294,643.26	.....
.....	17,083,700.00	Dividends	19,300,382.00	.....
.....	$17,377,950.46	Total appropriations of income	$19,595,025.26	.....
.....	$2,883,537.45	Income balance transferred to profit and loss	$6,014,948.11	.....

*Includes "Lap over" items credited and charged by Federal Administration.

CAPITALIZATION

Capital Stock:

The Capital Stock outstanding remained without change during the year.

Of the total amount outstanding.....$170,839,100

$2,100 was represented by fractional stock scrip convertible, in multiples of $100, into full shares. This scrip is not entitled to vote or to receive dividends until so converted.

Dividends paid during the year and charged to income for the year were:

June 26, 1922, 5% on $170,837,000..... $8,541,850

December 26, 1922, 5% on 170,837,000..... 8,541,850

Total charged to Income for the year..... $17,083,700

Funded Debt:

On December 31, 1921, the Funded Debt outstanding in the hands of the public was.....$173,619,300

During the year 1922 the following changes were made:

By issuance of First and Refunding Mortgage 5% Bonds, Series A, maturing February 1, 1971....$30,000,000

By the purchase of Nebraska Extension Mortgage Sinking Fund Bonds of 1927, $5,000

By the retirement of Equipment Gold Notes maturing January 15, 1922..... 404,000

By the retirement of Denver Extension Sinking Fund Bonds of 1922, maturing February 1, 1922..... 10,300 419,300

Total addition..... $29,580,700

On December 31, 1922, the Funded Debt outstanding in the hands of the public was.....$203,200,000

GENERAL OPERATIONS

Revenues:

Total Operating Revenues for 1922.....$164,916,470.54

Total Operating Revenues for 1921..... 168,712,268.15

Decrease ..... $3,795,797.61— 2.25%

This decrease was made up as follows:

Freight	Decreased	$1,327,728.69—	1.08%
Passenger	Decreased	3,615,944.66—	9.61%
Mail	Decreased	74,458.96—	1.72%
Express	Increased	317,487.27—	8.74%
Switching	Increased	476,415.74—	24.19%
Other transportation	Decreased	143,320.76—	8.16%
Incidental operating	Decreased	28,247.55—	.97%
Net Decrease		$3,795,797.61—	2.25%

The decrease in freight revenue was due to a decrease of 13 per cent in the rates on wheat, and 21 per cent on corn and other coarse grains, and 10 per cent on livestock; also 10 per cent on hay, fruits and vegetables effective January 1, 1922; and to a general reduction of approximately 10 per cent in freight rates (excepting those covering grain, livestock, fruits, vegetables and hay) effective July 1, 1922. Had it not been for these reductions there would have been a considerable increase in freight revenue as the total revenue tons one mile increased 11.37 per cent. Freight revenue was also adversely affected during the coal strike which lasted from April to August, inclusive; for instance, the earnings on soft coal in the five months, April to August, inclusive, in 1922 were $2,197,479 as compared with $9,180,369 for the same period in 1921, or a decrease in 1922 of $6,982,890.

The reduction in passenger revenue was due to a reduction in number of passengers carried. There was no change in basic passenger rates, but tourist rates were somewhat lower in 1922 than in 1921.

The reduction in mail revenue was due to curtailment of space in postal cars.

The increase in express revenue was brought about by reductions in expenses of the Express Company, due to cooperation of the railroads with the Express Company, resulting in an increased net revenue for division under the uniform contract with the Express Company.

Switching rates were reduced 10 per cent, effective July 1, 1922, but this reduction was more than offset by an increase in the volume of switching business.

A comparison of tonnage by commodities with 1921 shows increases:

Farm products	319,101 tons—	3.61%
Animals and products	314,083 tons—	12.38%
Mine products	35,302 tons—	.24%
Forest products	382,807 tons—	22.80%
Manufactured products	1,833,121 tons—	29.74%
Less-than-carload tonnage	175,368 tons—	8.59%
Total tonnage increased	3,059,962 tons—	8.47%

A comparison of carloads shows:

Total cars (all commodities) in 1922.....1,267,228 cars

Total cars (all commodities) in 1921.....1,138,140 cars

Increase in 1922..... 129,088 cars—11.34%

The increases shown above reflect the improvement in business conditions in 1922 as compared with 1921. Had it not been for the coal strike April to August, inclusive, the tonnage of mine products would have shown a much larger increase.

A summary of tonnage by commodities carried during 1922 is shown on pages 14 to 16, inclusive.

Operating Statistics:

Tons of revenue freight carried—1922	39,176,051	
Tons of revenue freight carried—1921	36,116,089	
Increase	3,059,962—	8.47%
Revenue tons one mile—1922	11,754,595,862	
Revenue tons one mile—1921	10,554,788,351	
Increase	1,199,807,511—	11.37%
Revenue tons per train mile—1922	628.82	
Revenue tons per train mile—1921	591.09	
Increase	37.73—	6.38%
Revenue tons per loaded car—1922	23.69	
Revenue tons per loaded car—1921	23.54	
Increase	.15—	.64%
Revenue passengers carried—1922	18,735,077	
Revenue passengers carried—1921	19,836,081	
Decrease	1,101,004—	5.55%
Revenue passengers carried one mile—1922	941,748,451	
Revenue passengers carried one mile—1921	999,701,152	
Decrease	57,952,701—	5.80%
Average distance carried—revenue passengers—1922	50.27	
Average distance carried—revenue passengers—1921	50.40	
Decrease	.13—	.26%

Expenditures (Operating):

Total operating expenses—1922.....$126,777,703.10

Total operating expenses—1921..... 128,216,289.68

Decrease ..... $1,438,586.58— 1.12%

The reduction in Operating Expenses was brought about by a continuation of the policy of rigid economy in all departments and would have been considerably greater had it not been for the large increase in cost of fuel consumed by locomotives due to high prices resulting from the coal strike April to August, inclusive, to the large payments of freight rates on foreign lines, and expense of longer haul on our own rails, on coal, bought to maintain our supply, from Alabama, Kansas and Southern Colorado; and also to the expense involved in connection with the shopmen's strike on July 1st, which for some weeks after that date, seriously interfered with economical operation.

The operating ratio was 76.87, as compared with 76.00 in 1921 and 88.52 in 1920. Had it not been for the reduction in rates which brought about a reduction in revenue and the extraordinary expenses in connection with the coal strike and the shopmen's strike, there would have been a further reduction in the operating ratio in 1922.

Expenditures (Capital):

There was expended during the year, chargeable to Capital Account:

For road	$8,245,321.60
For equipment	11,118,808.21
For general	7,212.51
Total	$19,371,342.32

Capital expenditures were made with a view to improving existing lines, and promoting safety, efficiency and service. No new lines or extensions were constructed.

The Chicago Union Station Company continued work and satisfactory progress was made with the Headhouse, including construction of foundations, which work is practically completed and ready for steel erection. Contracts for all steel and stone work required for the Headhouse were let during the year. All this material is now being fabricated and will shortly be erected on the completed foundations. The large Railway Mail Building was completed and occupied by the Government and the railroads on December 1st. New viaducts were built at Van Buren Street and Madison Street and a good portion of the widening of Canal Street was carried on at the same time, together with a large proportion of new tracks and platforms in the south end of the station layout. In spite of the considerable delay in the delivery of steel, it is now felt that the Station Company will be able to complete the main station building by the summer of 1924, so as to accommodate its tenants by that time.

Construction of the new inbound freight house at Harrison Street, Chicago, mentioned in last year's report, was nearing completion at the end of the year and will be ready for occupancy in April, 1923. There was expended on this project during the year, including house tracks, team tracks and related facilities, $727,221.54, chargeable to Capital Account. This project, when completed, will furnish much needed freight handling capacity of modern design and conveniently located with reference to the commercial center of the City.

At Aurora, Illinois, the elevation of tracks through the city was completed and put in service in November. New passenger station and new freight house in connection with this improvement were well advanced and will be completed early in 1923. There was expended on this project during the year $1,050,955.55 chargeable to Capital Account. As a result of this track elevation there has been a very gratifying improvement in the operation through Aurora of trains in both passenger and freight service, and at the same time the City is receiving the benefits of this noteworthy improvement in the way of grade separation through the business district.

At Eola, Illinois, there was begun the construction of a centralized plant for scrap storage and for reclaiming and renewing salvage material of all kinds. The total estimated capital cost is $259,306.00, of which $55,750.91 was expended in 1922.

Construction of large locomotive repair shops at Denver, Colorado, at an estimated cost of $2,301,767, was begun and is being rapidly pushed to completion, the expenditures for the year amounting to $333,329.55. These shops will serve the Colorado and Southern Lines as well as the Burlington, and will provide much needed facilities in that territory, and furnish relief to the shops at Havelock, Nebraska.

Modern passenger stations at Mitchell, Nebraska and Hardin, Montana, were completed at a cost of $25,037.09 and $22,252.79, respectively.

At Burlington, Iowa, an addition to present freight house was constructed at an expenditure of $23,937.22.

Construction of new power plant for locomotive terminal at Alliance, Nebraska, was undertaken and will be completed early in 1923; expenditures for the year amounting to $26,430.34 were charged to Capital Account.

A 6 stall roundhouse at Rock Island, Illinois, was practically completed at a cost of $35,683.44.

Additions to shop power plants at Creston, Iowa, costing $15,445.60, at Plattsmouth, Nebraska, costing $25,128.81, and at McCook, Nebraska, costing $41,983.97, were completed and put into service.

A 150 ton coal chute was completed at Bridgeport, Nebraska, at a cost of $38,752.94, a 100 ton coal chute at Fairmont, Nebraska, at a cost of $10,772.96 and a clinker pit at Lincoln, Nebraska, at a cost of $22,994.24.

A 5,000 ton ice house at Grand Crossing, Wisconsin, and a 1,500 ton ice house at Sheridan, Wyoming, were completed at a cost of $30,206.18 and $9,398.45, respectively.

Capacity of our tie treating plant at Sheridan, Wyoming, was increased by installing an additional retort at a cost of $37,576.03.

Construction of a 900,000,000 gallon reservoir at Galesburg, Illinois, was undertaken during the year, owing to increasing demands and frequent shortage of suitable water at that important terminal. This project was well advanced at the end of the year and will be completed in the spring of 1923. There was expended during the year on this work, $237,067.80, chargeable to Capital Account.

A plant for treating water for locomotive use and other purposes at Lincoln, Nebraska, was completed and put into service; the total cost being $29,358.84.

A new depot and extensive additions to yard facilities at Zeigler, Illinois, were completed at a total cost of $55,646.27.

A spur track 12 miles long from Hardin, Montana, north, for sugar beet loading, was completed at a cost of $203,183.99.

At Brookhurst, near Casper, Wyoming, extensive yard facilities were constructed at a total cost of $67,711.80, this improvement being made necessary by expanding oil business at that point.

In continuation of the program for double-tracking the line from Galesburg to Herrin, Illinois, to the Southern Illinois coal fields, additional second track was constructed between Walshville and Sorento, Illinois, 5.91 miles, and between Waltonville and Sessor, Illinois, 9.66 miles, at a cost of $366,528.43.

The double main track between Beardstown and Frederick, Illinois, was badly washed out in the Spring by exceptionally high water in the Illinois River and the breaking of drainage district levees, and all traffic was interrupted for eight days. In repairing the damage it was decided to raise these important tracks above high water level and strengthen the embankment. This work was completed except raising the second main track to the final grade, which it is expected will be done in 1923. The expenditures on this work during the year amounted to $140,424.04, of which $77,119.71 was chargeable to Capital Account.

Additional bank protection along the Missouri River at Nodaway, Missouri, and Folsom, Iowa, was constructed at a capital cost of $17,125.72.

Continuing the established practice of replacing temporary pile trestle bridges with permanent structures on important lines, there was expended for this purpose during the year $401,318.67, of which $323,741.60 was chargeable to Capital Account.

The program of extending automatic signal protection was carried out during the year. 59.32 miles of new automatic block signals having been completed and placed in operation and 124.07 additional miles being under construction, to be completed early in 1923; the total capital expenditures for the year on this work being $303,894.64.

There was laid in replacement, during the year in main track 266.57 miles of new 90-lb. and 100-lb. rail, and 130.44 miles of second-hand rail, the capital expenditures for this purpose amounting to $105,169.93 for the year.

There were delivered during the year, 32 freight and 8 passenger locomotives, also the following steel passenger cars and freight and Company service equipment:

5 Chair cars	500 Stock cars
42 Coaches	2000 Coal cars
10 Dining cars	800 Refrigerator cars
22 Mail cars	2 Motor cars
10 Mail and baggage cars	2 Ballast spreaders
1 Passenger and baggage car	1 Locomotive crane
3 Baggage cars	1 Railroad ditcher
1500 Box cars	1 Drag line scraper
400 Automobile cars	

Delivery will be made in 1923 of 100 automobile cars and 200 refrigerator cars to complete unfilled orders.

In addition to the above, 60 freight locomotives were ordered for delivery in 1923.

Valuation:

The work under the Federal Valuation Act of March 1, 1913, was continued during the year, with reduced forces. The total expenditures on account of valuation to December 31, 1922, were $3,157,983.40. The greater part of the expense during 1922 was for the replacing of records destroyed in the Chicago General Office building fire of March, 1922, and in preparing replies to preliminary Engineering, Land and Accounting Reports of the Government's Bureau of Valuation. Practically all field work has now been done and the remaining work is the placing in final form of certain records destroyed by the fire and such other data as might be required in any future review of valuation work and such preparation as may be necessary to meet the final value when served by the Commission.

General:

In the early morning hours of March 15th, the upper six floors of the General Office Building, in Chicago, were burned out and the lower floors much damaged by water. The fire originated in adjoining property and came through the windows of our buildings, but, notwithstanding the intense heat engendered by the burning records and other papers, the fire-proofing saved the frame of the structure from damage. The work of rehabilitation was practically completed by the end of the year, at a cost of about $1,265,000, of which $727,227.34 was collected on insurance, $460,000 charged against the Company's own insurance fund, $75,000 charged to Operating Expenses and the small balance remaining charged to Capital Account.

Progress has been made toward adjustment with the United States Government for the so-called Guaranty Period, under Section 209 of the Transportation Act, 1920, and it is expected the final settlement will be reached before the end of 1923.

During the year negotiations were had looking to the sale, by The Nashville, Chattanooga & St. Louis Railway and your Company, to the Illinois Central Railroad Company of a one-third interest in the Paducah & Illinois Railroad Company and a contract was signed on January 10, 1923. That contract will become effective on approval by the Interstate Commerce Commission.

During the year the Interstate Commerce Commission entered upon formal hearings, as required by the Transportation Act, 1920, for the object of determining a plan for grouping the railroads of the United States into a limited number of systems for purposes of consolidation. After consideration of the whole subject, your Board of Directors instructed the officers of the Company to co-operate with representatives of the Great Northern Railway Company, Northern Pacific Railway Company and The Colorado and Southern Railway Company in an endeavor to secure approval of the Commission of the grouping of the lines of those companies with those of this company, for the purpose of ultimate consolidation into a single system. Officers of your Company have appeared before the Commission in pursuance to these instructions and it is expected that the further hearings by the Commission relating to this subject will be concluded and that the final plan required by the law will be announced during the year 1923.

Your Board of Directors views with anxiety and concern the growing tendency in some quarters to criticise the Transportation Act, 1920, and the efforts by legislation to repeal essential provisions of it and thereby impair this constructive regulatory law. Thoughtful and fair-minded people have uniformly characterized this law as the first piece of constructive legislation, as distinguished from repressive regulation, that has appeared upon the statute books. It contains no guarantee of earnings, nor other artificial measures of protection to the vast investments in railroad properties throughout the country, but for the first time it did announce as a national policy that under reasonable rates and fares the railroads were entitled to an average rate structure calculated to enable them unde honest, efficient and economical management to earn a fair return.

Three years have elapsed since the railroads were returned by the Federal Government to their corporate owners for operation and since the Transportation Act, 1920, took effect. Recurring economic disturbances throughout this period of three years have made it impossible for this necessary and constructive piece of legislation to have had a fair trial. Sharp changes in the volume of traffic, increases in rates of wages, decreases in freight rates, unfortunate strikes by railroad labor and in the coal mining industry, seriously affecting expenses of operation, and continued high cost of materials and supplies have all contributed to a confused and variable set of conditions which have made the problems of management perhaps more difficult than ever before in the history of the railroads. These conditions offer no temperate basis for criticism of this important legislation. Nevertheless, the singular tendency has developed in some quarters to charge many of the distressing ills arising out of the troublesome period of economic reconstruction throughout the country to the operation of this law, and a curious and alarming impatience with the railroads has developed in the minds of many because the railroads have not been able, by some sort of miracle or otherwise, more rapidly to readjust their economic problems than other forms of industry throughout the country.

In consequence a growing tendency has appeared, born of these impatient conditions, for direct legislation relating to most of the important features of railroad regulation, instead of relying upon our established method of administering these intricate matters through the expert and experienced proceedings and judgment of the Interstate Commerce Commission. If this tendency brings about the enactment of drastic legislation that is pending, the results will not only be harmful to the continued development of the railroads and to the security of vast investments held by the public in them, but also will seriously impair the value of the entire scheme of regulation and the quasi-judicial methods of decision of the intricate and technical questions involved in the current adjustment of the rights and obligations of the railroads as well as the users of the transportation of the country.

Your Board of Directors believes that the Transportation Act, 1920, should have a further trial, without substantial amendment, over a reasonable period of more normal conditions before further legislation is attempted, asserting that the excellent record made by the railroads in 1922, in spite of the adverse results from the strikes in that year, demonstrates that the railroads are rapidly mastering the problems inherited from the war period and that with reasonable patience on the part of the public and a fair period of quiet, which will enable them to devote their best efforts to the public service, more rapid return to a lower scale of charges and normal conditions of service will result than through any other method.

Following herewith is the report of the Comptroller.

By order of the Board of Directors. HALE HOLDEN, President.

New York, Chicago & St. Louis Railroad Company — Thirty-Sixth Annual Report

To the Stockholders of

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY:

The Board of Directors herewith submits its report for the year ended December 31, 1922.

The capital stock authorized and issued to December 31, 1922, was..... being the same as at the close of the Previous year.		$30,000,000.00
The funded debt outstanding as of December 31, 1921, was		$36,930,000.00
It was decreased during the calendar year:		
By the retirement of Equipment Trust Certificates of 1916	$110,000.00	
By the retirement of Engine Trust Certificates of 1916	30,000.00	
By the retirement of Equipment Trust Certificates of 1917	124,000.00	
By the retirement of First Mortgage Bonds	108,000.00	372,000.00
		$36,558,000.00
It was increased during the calendar year:		
By the issuance of Equipment Trust Certificates of 1922	$3,510,000.00	
By the issuance of Note to U. S. Railroad Administration	1,000,000.00	4,510,000.00
Funded debt outstanding as of December 31, 1922		$41,068,000.00

During the year, Second and Improvement Mortgage Bonds with a par value of $4,035,000 (Series A, $1,008,000—Series B, $3,027,000) were executed and delivered to the Treasury of the Company, the purpose of the issuance of these bonds being to reimburse the Treasury of the Company for capital expenditures theretofore made by it. The Series A bonds, with a par value of $1,008,000, and Series B bonds with a par value of $381,000, were deposited as security for the $1,000,000 note issued to the U. S. Railroad Administration, and the remainder of the Series B bonds were held in the Treasury of the Company at the end of the year.

To provide more adequately for the efficient and economical handling of the Company's traffic, Equipment Trust Agreements were entered into during the year for the purchase of 150 double deck and 150 single deck composite stock cars, 400 steel underframe refrigerators cars, 1,000 steel underframe automobile cars, 4 Pacific passenger locomotives, and 15 Mikado freight locomotives, the total par value of Equipment Trust Certificates issued under these agreements being $3,510,000.

As of July 1, 1922, the Company entered into a contract with The Lake Erie and Western Railroad Company, which contract was approved by the Interstate Commerce Commission in Fiance Docket No. 2471, whereby the railroads and properties of the two companies are operated, managed and controlled by The New York, Chicago and St. Louis Railroad Company. This contract provides that all receipts, income, disbursements, expenses, and charges of every kind shall be divided between the two companies, as of December 31st in each year, on the same basis, as nearly as may be determined, as such income and expense would have been divided under separate operation and management. The usual financial and statistical statements, which are appended, show the results from operation of the properties of The New York, Chicago and St. Louis Railroad Company.

The Board takes pleasure in acknowledging the fidelity, efficiency, and united efforts displayed by your officers and employees in the discharge of their duties during the year.

For the Board of Directors,
J. J. BERNET,
President.

INCOME ACCOUNT

OPERATING INCOME		
Railway operating revenues		$29,056,784.84
Railway operating expenses		21,425,501.46
Net revenue from railway operations.....		$7,631,283.38
Railway tax accruals		$1,522,969.74
Uncollectible railway revenues		3,573.23
		$1,526,542.97
Railway operating income		$6,104,740.41
NONOPERATING INCOME		
Rent from locomotives		$55,012.28
Rent from passenger-train cars		18,306.47
Rent from work equipment		9,638.87
Joint facility rent income		80,779.36
Miscellaneous rent income		38,251.32
Miscellaneous nonoperating physical property		22,588.23
Income from funded securities		33,708.33
Income from unfunded securities and accounts.....		208,778.55
Income from sinking and other reserve funds		425.00
Miscellaneous income		2,071.77
Total nonoperating income		$469,560.18
Gross income		$6,574,300.59
DEDUCTIONS FROM GROSS INCOME		
Hire of freight cars—Debit balance		$160,467.16
Rent for locomotives		5,469.05
Rent for passenger-train cars		45,795.00
Rent for work equipment		3,043.88
Joint facility rents		223,698.97
Rent for leased roads		5,689.90
Miscellaneous rents		168,914.05
Miscellaneous tax accruals		14,303.94
Interest on funded debt		1,709,335.73
Interest on unfunded debt		50,719.03
Amortization of discount on funded debt.....		44,374.75
Miscellaneous income charges		22,495.18
Total deductions from gross income.....		$2,454,306.64
Net income		$4,119,993.95

DISPOSITION OF NET INCOME	
Applied to retirement of first mortgage bonds.....	$98,226.00
Dividend appropriations of income	1,499,365.00
Total sinking fund and dividend appropriations.....	$1,597,591.00
Income balance transferred to profit and loss account...	$2,522,402.95

GENERAL BALANCE SHEET, DECEMBER 31, 1922

ASSETS

INVESTMENTS—			
Investment in road and equipment:			
Road $56,354,987.75			
Equipment 20,084,210.79			
General expenditures..... 81,645.29			
		$76,520,843.83	
Improvements on leased railway property....		774,423.08	
Sinking fund for Equipment Trust Certificates of 1917		137,345.40	
Miscellaneous physical property.....		2,625,455.52	
Investments in affiliated companies:			
Stocks $1,505,400.00			
Advances 239,420.42			
		1,744,820.42	
Other investments:			
Miscellaneous		224,671.57	
			$82,027,559.82
CURRENT ASSETS—			
Cash		$2,427,033.94	
Time drafts and deposits.....		1,000,000.00	
Special deposits		1,791,248.75	
Loans and bills receivable.....		185,430.99	
Traffic and car service balances receivable....		940,129.03	
Net balance receivable from agents and conductors		457,120.16	
Miscellaneous accounts receivable.....		803,076.18	
Material and supplies.....		2,361,252.69	
Interest and dividends receivable.....		25,551.40	
Rents receivable		20,919.55	
Other current assets.....		177.30	
			10,011,939.99
DEFERRED ASSETS—			
Working fund advances.....		$7,259.61	
Insurance and other funds.....		10,287.50	
Other deferred assets.....		6,206.50	
			23,753.61
UNADJUSTED DEBITS—			
Discount on funded debt.....		$370,065.45	
Other unadjusted debits.....		2,846,727.53	
Securities issued or assumed—Unpledged:			
Capital Stock of The New York, Chicago and St. Louis Railroad Co., held in treasury $12,700.00			
Second and improvement mortgage bonds held in treasury. 3,682,000.00			
		3,694,700.00	
Securities issued or assumed—Pledged:			
Second and improvement mortgage bonds in Federal Reserve Bank, Cleveland, O.....		1,389,000.00	
			8,300,492.98
			$100,363,746.40

LIABILITIES

STOCK—			
Capital stock:			
First preferred		$5,000,000.00	
Second preferred		11,000,000.00	
Common		14,000,000.00	
			$30,000,000.00
LONG TERM DEBT—			
Funded debt unmatured:			
Equipment obligations		$7,348,000.00	
First mortgage bonds.....		17,764,000.00	
Gold bonds of 1906.....		10,000,000.00	
Second and improvement mortgage bonds..		4,956,000.00	
Second and improvement mortgage bonds nominally issued		5,071,000.00	
Collateral trust notes:			
Note to U. S. Railroad Administration..		1,000,000.00	
			46,139,000.00
CURRENT LIABILITIES—			
Loans and bills payable.....		$25,000.00	
Traffic and car service balances payable.....		1,280,451.27	
Audited accounts and wages payable.....		1,672,970.70	
Miscellaneous accounts payable.....		166,279.21	
Interest matured unpaid.....		34,567.50	
Dividends matured unpaid.....		303,145.25	
Unmatured interest accrued.....		407,083.33	
Other current liabilities.....		69,910.12	
			3,959,407.38
DEFERRED LIABILITIES—			
Other deferred liabilities.....			58,614.68
UNADJUSTED CREDITS—			
Tax liability		$1,209,364.66	
Operating reserves		150,000.00	
Accrued depreciation—Equipment.....		4,022,584.91	
Other unadjusted credits.....		155,358.46	
			5,537,308.03
CORPORATE SURPLUS—			
Additions to property through income and surplus		$5,253,225.18	
Funded debt retired through income and surplus		1,674,814.91	
Total appropriated surplus.....		$6,928,040.09	
Profit and loss—Balance.....		7,741,376.22	
			14,669,416.31
			$100,363,746.40

Railway Officers

Operating

R. F. **Goering,** general manager of the Rio Grande, El Paso & Santa Fe with headquarters at El Paso, Tex., has been appointed superintendent of terminals of the Atchison, Topeka & Santa Fe with the same headquarters, the operation of the former road having been taken over by the latter.

John Edward Hughes, whose appointment as superintendent of the Pittsburgh & Lake Erie with headquarters at Pittsburgh, was announced in the *Railway Age* of April 14, page 978, was born in South Wales on May 25, 1873, and received a common school education. He entered railway service on September 21, 1889, with the Pittsburgh & Lake Erie at Pittsburgh. Since that time he has served in various positions in the operating department, including those of yardmaster, general yardmaster, terminal trainmaster and superintendent of terminals. This latter position he was holding at Youngstown, Ohio, when he was promoted to superintendent at Pittsburgh.

J. E. Hughes

J. A. Gillies, trainmaster for the Atchison, Topeka & Santa Fe, with headquarters at Dodge City, Kan., has been promoted to assistant superintendent, with the same headquarters. **E. P. Dudley,** chief dispatcher, with headquarters at Dodge City, has been promoted to trainmaster, succeeding Mr. Gillies.

Traffic

F. C. Regan has been appointed general agent, traffic department, of the Chicago & Alton, with headquarters at Los Angeles, Cal.

G. W. Krause has been appointed division freight agent for the Pennsylvania, with headquarters at Canton, Ohio, succeeding J. D. Lippincott, deceased.

W. Pasho has been appointed general agent of the Chicago, Milwaukee & St. Paul, with headquarters at Indianapolis, Ind. **R. F. Trumper,** traveling freight agent, has been appointed general agent, with headquarters at Buffalo, N. Y.

J. J. Sullivan, traveling freight agent for the Chicago, St. Paul, Minneapolis & Omaha, with headquarters at Sioux Falls, S. D., has been promoted to general agent, in charge of freight and passenger traffic, with the same headquarters.

Charles Campbell, general freight and passenger agent of the Ironton Railroad with headquarters at Hokendauqua, Pa., has been promoted to auditor, the office of auditor and general freight and passenger agent having been consolidated.

T. E. Bond, assistant traffic manager of the Elgin, Joliet & Eastern with headquarters at Chicago, has been promoted to traffic manager with the same headquarters, succeeding W. L. Louis, whose death on April 24 was reported in the *Railway Age* of April 28.

W. L. Radford, general eastern freight agent of the Atlantic Coast Line, with headquarters at New York, has been appointed general live stock agent, with headquarters at Savannah, Ga. **A. R. Mulkins,** commercial agent at Philadelphia, Pa., has been promoted to eastern freight agent, with headquarters at New York, succeeding Mr. Radford. **F. J. O'Connor,** traveling freight agent, with headquarters at Rochester, N. Y., has been promoted to commercial agent at Philadelphia, Pa., succeeding Mr. Mulkins. **J. B. Brantly,** commercial agent at Ocala, Fla., has been transferred to Wilmington, N. C. **A. L. Wolf** has been appointed commercial agent, with headquarters at Kansas City, Mo.

C. J. Rohwitz, whose promotion to general passenger agent of the Chicago, Burlington & Quincy, with headquarters at St. Louis, Mo., was reported in the *Railway Age* of March 31, was born on November 2, 1874, at Downs, Kan. He entered railway service on March 5, 1898, as a check clerk on the Chicago, Burlington & Quincy at Atchison, Kan., and subsequently served as yard clerk, bill clerk, general freighthouse foreman, contracting freight agent and city passenger agent at the same place. He was transferred to Kansas City as joint city ticket agent of the Chicago, Burlington & Quincy and the Missouri, Kansas & Texas in August, 1903, and two years later was promoted to traveling passenger agent for the Burlington, with headquarters at St. Louis, Mo. He was promoted to chief clerk in the general passenger office at St. Louis on June 1, 1911, and served in this capacity until March 15, 1920, when he was promoted to general agent, with headquarters at Dallas, Tex. He was serving in this capacity at the time of his recent promotion to general passenger agent, with headquarters at St. Louis.

Frederick H. Clendenning, whose appointment as foreign freight agent of the Canadian Pacific with headquarters at Vancouver, B. C., was announced in the *Railway Age* of April 7, page 933, was born in Montreal, November 9, 1881, and was educated in the common and senior schools of that city. He entered the service of the Canadian Pacific in 1898 as a junior clerk and stenographer in the office of the fourth vice-president. In 1902 he entered the employ of the New York Central as stenographer and clerk to the commercial agent at Montreal. Two years later he went to Vancouver as stenographer, rate and tracing clerk for the Canadian Pacific. In the following year he was appointed chief clerk in the city freight office at Victoria, B. C. A short time thereafter he was promoted to a similar position in the district freight office and in 1908 became city freight agent of the Canadian Pacific and district agent of the Esquimalt & Nanaimo at Victoria. The following year he was promoted to assistant general freight agent of the Canadian Pacific and in 1911 was appointed district freight agent. In 1914 he became division freight agent of the Canadian Pacific steamer lines and in 1919 was promoted to assistant foreign freight agent which position he held to the time of his recent promotion. From the outbreak of the war until 1919, in addition to his duties with the Canadian Pacific, he supervised the handling of government vessels under the overseas transport department. In 1918 and 1919 he served with the British Ministry of Shipping (Canada).

Richard C. Campbell, whose appointment as general freight agent of the Philadelphia & Reading with headquarters at Philadelphia, was announced in the *Railway Age* of April 7, page 933, was born at Davenport, Iowa, on September 2, 1866. He was educated at Greylock Institute, South Williamstown, Mass., and at Williams College. He entered railway service as student in the office of the freight agent of the Philadelphia & Reading at Port Richmond, Philadelphia. A short time thereafter he was appointed assistant inspector of the Philadelphia & Reading Coal & Iron Company. The following year he became traveling coal inspector in the office of the line sales agent of the same company. A short time thereafter he was promoted to traveling sales agent and inspector. In 1894 he was appointed chief clerk and during 1896 served in that capacity to the general manager of the coal company and the second vice-president of the Philadelphia & Reading. In 1899 he became general western freight agent for the Reading at Chicago and in 1910 was appointed to serve in a similar capacity for the Central of New Jersey as well as the Reading. During federal control he served as special agent in the freight traffic department and in March, 1920, was again appointed general western freight agent of the Reading and Jersey Central at Chicago. In September,

1922, he was promoted to assistant general freight agent of the Reading with headquarters at Philadelphia in which capacity he was serving at the time of his recent promotion as noted above.

Mechanical

J. F. Long, master mechanic of the Baltimore & Ohio with headquarters at Connellsville, Pa., has been appointed superintendent of motive power and machinery of the Los Angeles & Salt Lake with headquarters at Los Angeles, Cal., succeeding C. M. Hoffman, who has resigned.

C. K. Woods, whose promotion to assistant superintendent of motive power of the Pere Marquette, with headquarters at Detroit, Mich., was reported in the *Railway Age* of April 21, was born on January 14, 1868, at Uxbridge, Canada. He entered railway service in 1885, in the mechanical department of the Erie & Huron, a Canadian line. Mr. Woods was employed as a machinist in the shops of the Toledo Central & Western at Frankfort, Ind., in 1892, and was subsequently promoted to general foreman at the same place. He was appointed master mechanic of the Pere Marquette, with headquarters at Saginaw, Mich., in 1900, and served in this capacity for 18 years. In 1918, at the beginning of federal control, he was appointed supervisor of equipment, but upon the termination of federal operation in 1920, returned to his position as master mechanic at Saginaw. He was serving in this capacity at the time of his recent promotion to assistant superintendent of motive power, with headquarters at Detroit. The position which he now holds is one recently created.

C. K. Woods

Engineering, Maintenance of Way and Signaling

Wendell P. Ball has been appointed engineer in charge of maintenance of the Pittsburgh & West Virginia and the West Side Belt Railroad with headquarters at Pittsburgh, Pa.

R. W. Meek has been appointed signal engineer of the Southern Pacific, Texas and Louisiana lines, with headquarters at Houston, Tex., succeeding E. E. Worthing, who has resigned.

S. L. Church, whose promotion to engineer maintenance of way of the Illinois division of the Pennsylvania, with headquarters at Chicago, was reported in the *Railway Age* of April 14, was born on August 13, 1881, at Middletown, Conn. He graduated from Sheffield Scientific School, Yale University, in 1903, and entered railway service on July 8 of that year as a transitman on the Buffalo and Allegheny division of the Pennsylvania, with headquarters at Buffalo, N. Y. In August, 1905, he was transferred to Altoona, Pa., and in May, 1906, was promoted to assistant supervisor, with headquarters at Wilkes-Barre, Pa. He was promoted to supervisor in the office of the assistant general manager, with headquarters at Philadelphia, Pa., in 1912, and in July, 1917, was promoted to division engineer of the Delaware division, with headquarters at Wilmington, Del. He was transferred to the Conemaugh division, with headquarters at Pittsburgh, Pa., in February, 1918, and was subsequently transferred to the Maryland and the Baltimore divisions. He was serving as division engineer of the Baltimore division, with headquarters at Baltimore, Md., at the time of his recent promotion to engineer maintenance of way of the Illinois division, with headquarters at Chicago.

Special

J. M. Jones has been appointed general agricultural agent of the Seaboard Air Line with headquarters at Savannah, Ga., the position of general development agent having been abolished. **C. A. McKeand** has been appointed general industrial agent.

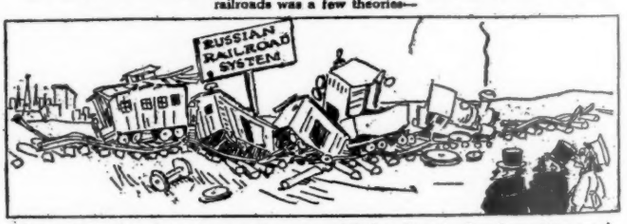
Obituary

C. N. Davids, who served for 35 years as purchasing agent of the Colorado Midland and later as purchasing agent of the Denver & Salt Lake, died on May 3 at Alamosa, Col.

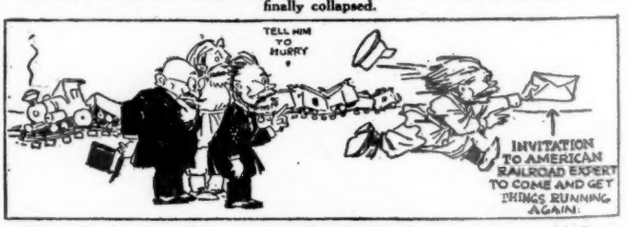
W. L. Blair, superintendent of telegraph of the New York, Chicago & St. Louis, with headquarters at Cleveland, Ohio, died on April 4. Mr. Blair was born on December 27, 1858, at Hamilton, Ohio, and entered railway service in December, 1872, as a telegraph operator on the Cincinnati, Hamilton & Dayton. He was appointed chief clerk to the general superintendent in August, 1878, and held this position until September, 1881, when he was appointed chief clerk to the general superintendent of the New York, Chicago & St. Louis. He was promoted to superintendent of the Eastern division in October, 1893, and served in this capacity until March 1, 1901, when he was appointed superintendent of telegraph. He was again appointed superintendent of the Eastern division, with headquarters at Buffalo, N. Y., in October, 1905, and a year later was promoted to superintendent of transportation. He was promoted to assistant to the general manager on June 15, 1912, and was appointed superintendent of telegraph on June 1, 1913, in which position he was serving at the time of his death.

GREAT MYSTERY—WHO GOT THE LETTER?

Once there was a small group of liberal souls who thought all that was needed to run the railroads was a few theories—



But, sad to relate, their transportation system failed to thrive under the treatment and finally collapsed.



Whereupon they dispatched urgent appeals to America for expert talent to rehabilitate their railway systems.

And the strange thing about it is that neither Senator La Follette nor Senator Brookhart ever got the message.